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ANN DRUYAN ON THE WONDERS OF COSMOS

The Runaway Toyota Panic: Threat or Hysteria?

The Rhetoric of Extraordinary Claims

An Introduction to Homeopathy

SPECIAL REPORT: TV's Mystery Mongering 'Killer Yeti'

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[FROM THE EDITOR

The *Cosmos* Odyssey of Ann Druyan

This spring science fans had reason to rejoice. A marvelous new documentary television series, *Cosmos: A Spacetime Odyssey*, featuring charismatic astrophysicist Neil deGrasse Tyson as the on-screen host, aired on the Fox and National Geographic channels in the United States and on other channels in 181 countries. The driving force behind the new *Cosmos* is creator, writer, and producer Ann Druyan, who also was deeply involved in the original *Cosmos* series thirty years earlier with her famous astronomer husband, Carl Sagan. Druyan shared not only a life with Sagan but a poetic view of science and the natural world and an unparalleled ability to communicate its wonders and values to the general public. All those sensibilities, together with narrative storytelling and twenty-first-century production values, give the new *Cosmos*, like the original, a transcendent power and appeal. Also clearly evident, and especially welcome this time, was a decision to forthrightly present the scientific evidence on evolution and climate change and other contemporary issues with none of the usual waffling. Critics and the public warmly welcomed *Cosmos*, and in July it was richly rewarded with twelve Emmy nominations, the most of any nonfiction programming.

In this issue we present two interviews with Ann Druyan. In the first, I pose five questions about the new *Cosmos* series and its reception, and she responds with her usual clarity and enthusiasm. Then we offer a condensed version of a Center for Inquiry *Point of Inquiry* podcast interview with her by Josh Zepps, conducted shortly after the series began. Its full version is online, as are several earlier *Point of Inquiry* interviews with Tyson. Tyson was traveling and unavailable for a new interview while we were preparing this issue but gave us a succinct comment upon his return (page 38). As I pointed out earlier, Druyan and Tyson (as was Sagan before them) are Fellows of the Committee for Skeptical Inquiry and strong supporters of our efforts to advance good science.

Also in this issue the noted author, attorney, and investigator Michael Fumento takes on the runaway Toyota hysteria of a few years ago. His densely documented research reveals the perhaps surprising conclusion: Despite all the media publicity at the time about death-trap Toyota automobiles running amok, there was in fact no increase in injuries or deaths. It was another case of media-genic mass hysteria. This article presents one more instance where common presumptions wither under detailed critical scrutiny, a hallmark of scientific and skeptical thinking.

We skeptics have our heroes, and James Randi is certainly one of them. Read Massimo Polidoro's column in this issue about *An Honest Liar*, a new movie about Randi, and Polidoro's announcement that he will take on the task of writing Randi's biography. A number of people have been working on the biography project, and it is welcome news indeed that Massimo will now see it through.

—Kendrick Frazier

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The Great and Powerful Dr. Oz Humbled in Senate Hearing

David H. Gorski

In June, the U.S. Senate Subcommittee on Consumer Protection, Safety, and Insurance, chaired by Senator Claire McCaskill (D-Missouri), held a hearing on "Protecting Consumers from False and Deceptive Advertising of Weight-Loss Products." Likely few had heard of most of the witnesses giving testimony, which included representatives from the Federal Trade Commission, supplement manufacturers, and online advertising groups. However, one witness, Dr. Mehmet Oz, stood out for his fame and influence. Host of the popular daytime program *The Dr. Oz Show* and dubbed "America's Doctor" by his patron Oprah Winfrey, Dr. Oz regularly promotes dubious weight loss advice and supplements with the enthusiastically hyperbolic language of an old-time snake oil salesman.

As if that weren't bad enough, intermixed with more conventional medical topics Dr. Oz has also featured quackery such as faith healing, "cleanses," "detoxification," and homeopathy; Internet quacks such as Joseph Mercola and Mike Adams; and psychics such as John Edward and "Long Island Medium" Theresa Caputo. It's not for nothing that, upon learning of Dr. Oz's impending testimony, one blogger quipped, "That's like asking Al Capone to testify about U.S. tax policy."

Congressional hearings tend to resemble a Japanese Kabuki play: highly stylized and constrained. Indeed, the term "Kabuki dance" is sometimes used in politics to describe an event designed to create the appearance of uncertain outcome when in fact the "actors" know how it is likely to end. The question at the time of the announcement was what the end of this particular Kabuki dance was intended to be. Skeptics had reason to be concerned that the hearing could become a forum in which Dr. Oz was allowed to paint himself the victim of weight-loss scammers using his name to sell their products, a complaint Dr. Oz has made on his show. Alarmed, they flooded Sen. McCaskill's office with emails containing links to sources documenting Dr. Oz's tenuous relationship with science-based medicine. It will likely never be known whether McCaskill had planned a trap all along or whether skeptics persuaded her to shift emphasis, but she did at one point use the term "science-based medicine," a term that is not commonly used outside of skeptical circles. This suggests that maybe—just maybe—she had read material from the *Science-Based Medicine* blog about Dr. Oz.

Mehmet Oz, host of the *Dr. Oz Show*, testifies at a Consumer Protection, Product Safety, and Insurance Subcommittee hearing in Russell Building titled "Protecting Consumers from False and Deceptive Advertising of Weight-Loss Products," June 17, 2014. (Photo By Tom Williams/CQ Roll Call)

Whatever the case, unfortunately for Dr. Oz, the ending of *this* Kabuki dance was not pleasant for him. Although his star power did result in extensive news coverage for the hearing, it certainly wasn't the sort of coverage Oz wanted. Unexpectedly, Oz found himself the main target of the senators' wrath, particularly Sen. McCaskill's, over the inflated claims about weight-loss supplements he regularly makes on his show. Unused to not being surrounded by an adoring audience, Dr. Oz faltered and became visibly flustered at points.

As is usual for such a hearing, each witness was allowed to read a prepared statement. Dr. Oz's statement was, as expected, self-serving, touting his commitment to educating his viewers about supplements and diet. However, he must have had an inkling of what might be coming, because his statement also justified his show's approach as being necessary to "engage the viewer" and defended his having characterized green coffee bean extract as a "miracle," while grudgingly acknowledging that his characterization had resulted in "an explosion of ads and marketing." Then, completely missing the point, he discussed episodes of his show in which he went after supplement manufacturers using his name to advertise the two main diet supplements he had promoted, green coffee bean extract and garcinia cambogia.

When it came time to question Dr. Oz, Sen. McCaskill would have none

of it. She quoted from his show:

- On green coffee extract: "You may think magic is make-believe, but this little bean has scientists saying they found the magic weight-loss for every body type."
- On raspberry ketone: "I've got the number one miracle in a bottle to burn your fat."
- On garcinia cambogia: "It may be the simple solution you've been looking for to bust your body fat for good."

Sen. McCaskill said, "I don't get why you need to say this stuff, because you know it's not true. So why, when you have this amazing megaphone and this amazing ability to communicate, why would you cheapen your show by saying things like that?"

Dr. Oz was clearly taken off guard, and it showed in his body language. He started out by disagreeing that green coffee beans don't work and tried to cite multiple studies, but McCaskill had done her homework and knew that the study Oz had relied on was small and funded by the manufacturer. Oz then retreated into a highly disingenuous false equivalence by saying that many of the things we recommend with respect to diet are controversial and arguing that medicine advances by embracing new ideas and challenging old ideas.

It was deceptive nonsense, of course, because the controversies over these sorts of issues tend to be based in far better evidence on both sides than the evidence Oz was able to muster to defend his green coffee bean extract show. Unwittingly, he also basically admitted that the "clinical trial" he himself did with green coffee bean extract wasn't a real clinical trial at all, that it wouldn't pass scientific muster, and that it wasn't carried out under "appropriate IRB guidance." Although it is unlikely that anyone realized it at the time, in other words, Dr. Oz admitted in front of a Senate committee that he had performed research on human subjects without proper ethical approval, as had been pointed out by skeptics.

And so it went. Oz tried to defend himself, admitting that he uses "flowery" language to express his enthusiasm for the products he discusses on his show but justifying it by characterizing himself as a cheerleader for weight loss and health, even though he was forced to admit that none of his recommendations besides diet and exercise have actually been proven to work. He also kept saying that those shows from which McCaskill quoted were two years old and that he "doesn't use that kind of language any more." Unfortunately for Dr. Oz, McCaskill had done her homework about this as well and immediately rattled off examples of language just as "flowery" from recent *Dr. Oz Show* episodes. Oz also kept repeating that he himself doesn't sell any supplements, which is true but irrelevant. He's featured many people on his show who *do* sell supplements and allowed them to turn their appearances on his show into infomercials for their products.

At one point, Dr. Oz tried a nonsensical defense in which he confessed that he now thinks he's done his audience a "disservice" by not giving them a list of "reputable" companies that sell the products featured on his show, while again complaining about the misuse of his name by scammers. Sen. McCaskill saw right through that ploy as well, retorting, "I know you feel that you're a victim, but sometimes conduct invites being a victim. I think that if you would be more careful, maybe you wouldn't be victimized quite as frequently."

At the end of the hearing, McCaskill gave Oz a chance at redemption, saying, "We didn't call this hearing to beat up on you but we did call this hearing to talk about a real crisis in consumer protection, and you can be part of the problem or you can be part of the police." Dr. Oz, chastened, promised in essence to be a good boy from now on and affirmed that he wanted to be part of the police. In addition to promising to tell his audience which supplements meet his exacting standards, Oz promised to use less "flowery" language in the future, although the way he phrased it left considerable doubt over whether he meant it.

In the end, unexpectedly this hearing became a big win for science-based medicine. Unfortunately, it was only one battle. Whether any legislation or policy changes with respect to weight-loss supplement scams will come out of it remains to be seen, as does the issue of whether Oz will make any substantive changes to his show next season. Seeing Dr. Oz humbled by a Senate committee is satisfying, but it is not enough.

For Further Information

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HAARP Conspiracy Theory 'Weather Super-Weapon' Program Shuts Down

Benjamin Radford

Overhead photo of the HAARP Gakona Facility.

A scientific research program based in Alaska is shutting down later this year, much to the relief of many conspiracy theorists who believe it has been used as a global super-weapon. According to an article in the *Anchorage Daily News*, "The U.S. Air Force gave official notice to Congress Wednesday [May 14, 2014] that it intends to dismantle the $300 million High Frequency Active Auroral Research Program [HAARP] in Gakona this summer. The shutdown of HAARP, a project created by the late Sen. Ted Stevens when he wielded great control over the U.S. defense budget, will start after a final research experiment takes place in mid-June, the Air Force said in a letter to Congress Tuesday [May 13, 2014]. . . . Built at a cost of more than $290 million, the site has 180 antennas on 30 acres that are used to direct energy into the ionosphere, which is 55 miles to 370 miles above the Earth, and monitor changes in the flow of charged particles."

The program has become a favorite subject of conspiracy theorists, who suggest that it had some sinister purpose. Nick Redfern, in his book *Keep Out! High Security Facilities, Underground Bases, and Other Off-Limits Areas*, asks rhetorically, "Is such technology already being secretly utilized on a planet-wide scale, in order to instill fear in, and exert control over, the world's population, and also exert military control and influence over areas of strategic interest? Many conspiracy theorists say yes. . . . Those who see HAARP as having a distinctly covert agenda point to what they consider the project's darkest of all secrets: The earthquake in Haiti."

Redfern suggests that the January 2010 7.0 magnitude earthquake—which leveled much of Haiti's urban

Keeping Pseudoscience and Religion Out of Health Care

Being secular implies a commitment to using science, not supernatural revelation, as a means of determining the most effective therapies. In the context of health care, sound science implies evidence-based medicine. Sadly, despite the tremendous success of evidence-based medicine, too many individuals rely on pseudoscientific remedies. Here we see another threat to health care, one not derived expressly from religion but one traceable to a similarly dogmatic mindset. Pseudoscientific remedies have flooded the health care system, whether it's Reiki, homeopathic drugs, naturopathy, or any other sham therapy pulled from medicine's back room of mysticism and magic. It's scandalous that these quack therapies can be peddled with impunity. The Food and Drug Administration largely takes a hands-off approach, declining to test homeopathic drugs for efficacy, and major universities and medical centers push "complementary and alternative medicine" on patients at their clinics. It's a lot easier to make a profit from "alternative medicine" than real medicine.

"It's scandalous that these quack therapies can be peddled with impunity."

We need to take control of our health care. No church, no religious doctrine should be allowed to interfere with our heath care choices. Likewise, we need to insist that all therapies offered to the public be rigorously tested for safety and efficacy. We need to keep health care both safe and secular.

—Ronald A. Lindsay, "Secularism and Health Care," commenting on the Center for Inquiry's new campaign "Keep Health Care Safe and Secular," announced June 3, 2014. On the CFI website at www.centerforinquiry.net/news/safe_and_secular

Ronald A. Lindsay is president and CEO of the Center for Inquiry and its affiliate, the Committee for Skeptical Inquiry.

areas and killed at least 100,000 people—"was a deliberate HAARP-induced event, designed to provide the United States government with a reason to make its presence strongly felt in an area in which it had special interests." In classic follow-the-money-not-the-facts conspiracist thinking, the specific "special interests" in this case is oil. Redfern writes that "HAARP can be secretly utilized to find underground and undersea oil reserves." How, exactly, a technology designed for studying the ionosphere—which extends high above Earth's surface—is also used for detecting underground oil reserves or causing earthquakes is never explained.

In classic follow-the-money-not-the-facts conspiracist thinking, the specific "special interests" in this case is oil.

Crass desire for oil as a reason to kill hundreds of thousands of people and devastate an already poor country might be more plausible if the United States wasn't already one of the world's top oil producers (getting most of the balance from Canada and South America), if devastating a country's infrastructure could somehow help (instead of greatly impede) the ability to access oil underneath it, and if America hadn't donated over $1.4 billion in earthquake recovery aid. Four-and-a-half years later, there seems to be little or no evidence of the urgent oil exploration that was presumably the whole point of the ruthless top-secret HAARP conspiracy project.

Of course it's not just the Haiti earthquake. Conspiracy theorists also suspect HAARP of causing the 2011 earthquake and the resulting tsunami that led to the Fukushima nuclear meltdown. Why would the U.S. government want to cause an earthquake in, and irradiate part of, a close ally's country? Oil, of course.

As for HAARP itself, Brian Dunning, writing for his *Skeptoid* podcast, notes that "there's nothing remotely secret or even classified about HAARP. No security clearance is needed to visit and tour the site, and HAARP usually holds an open house every summer during which anyone can see everything there. During the rest of the year, research is conducted. . . . There are several other similar research stations around the world. . . . Sadly for the conspiracy theorists, HAARP has no potential to affect weather. The frequency of energy that HAARP transmits cannot be absorbed by the troposphere or the stratosphere, only by the ionosphere, many kilometers higher than the highest atmospheric weather systems."

The program is being shut down because its research is done and its funding is spent. The fact that the HAARP project is over will, of course, not deter conspiracy theorists. Some will claim that the shutdown is only of the "official" work but that "black ops" projects will continue there in even greater secrecy. Those who accept that the project truly has ended will likely proudly take credit for having helped force the government to shutter it by getting the truth out there.

Benjamin Radford, MEd, is deputy editor of the Skeptical Inquirer and author or coauthor of seven books, including *Mysterious New Mexico: Miracles, Magic, and Monsters in the Land of Enchantment*, available now from the University of New Mexico Press.

Urban Legend Character Slenderman Cited in Girl's Stabbing

Benjamin Radford

Police in Waukesha, Wisconsin, arrested two twelve-year-old girls in the grisly May 31, 2014, stabbing of another girl, allegedly to prove their devotion to a fictional character they learned about online. The girls, Morgan E. Geyser and Anissa E. Weier, are accused of attempting a murder they had been planning for several months. They lured their friend, also twelve, into a wooded area, where one girl allegedly held the victim down while the other stabbed her nineteen times.

According to an article in the *Milwaukee Wisconsin Journal Sentinel*,

> When confronted by police, Weier immediately began explaining about the Web site Creepypasta. Weier said she introduced Morgan Geyser to the site back in December. A character named "Slenderman" is the leader of Creepypasta, and below Slenderman is the killer and below the killer is a proxy. Weier explained that in order to be a proxy you needed to kill a person in order to show your dedication to Slenderman. Weier said that many people don't believe Slenderman is real and she wanted to prove the skeptics wrong. Weier said that Geyser told her they should become "proxies" of Slenderman, and in order to do so, they needed to kill their friend, the victim, to prove themselves worthy of Slenderman. . . . The suspects believed that "Slender," as Weier called him, lived in a mansion in the Nicolet National Forest in Wisconsin. The plan was to kill the victim and walk to Slender's mansion and become one of his proxies, according to the criminal complaint.

The victim was hospitalized in serious but stable condition while the two girls accused of trying to kill her face charges of attempted first-degree intentional homicide.

Folklorist Gail de Vos, in her book *What*

Happens Next? Contemporary Urban Legends and Popular Culture, explains Slenderman's origin: "Recognized as a fictional contemporary urban legend, created by 'Victor Surge' on the Something Awful forums on June 8, 2009, Slenderman has gained prominence beyond the confines of the online forums. He is most often portrayed as a malevolent entity abducting and psychologically traumatizing people after stalking them for a long while." The character is wildly popular among online fans, as Sharon Hill of Doubtful News noted in an article in the February 2013 *Fortean Times* magazine: Slenderman "currently stars in an array of videos, Youtube series, alternate reality games, fan art, online horror stories and parodies. . . . Slenderman is an evolving meme."

The two Wisconsin girls are not alone in believing in the literal existence of Slenderman. Though most people recognize that this boogeyman is fictional and no more real than Freddy Krueger or Captain Hook, not everyone is convinced. Rev. Robin Swope, a pastor at St. Paul's United Church of Christ in Erie, Pennsylvania, believes the Internet-generated monster is real. In his book *Slenderman: From Fiction to Fact*, Swope states that, after years of reviewing stories sent to him by people who claim to have encountered the elusive monster, he has concluded that Slenderman is a literal demonic entity:

> We can come to the conclusion that Slenderman is real. The archetype of death that Slenderman embodies is not an archetype at all. Slenderman is the archetype. He is indeed death personified who from countless ages past has hunted down humanity with a relentless determination. If you see him as a child he will forever haunt your dreams and your waking nightmares. . . . There is nothing you can do about it, it is inevitable. Begging and screaming are useless; Slenderman makes no bargains and takes no bribes. Slenderman is coming for you.

According to Rev. Swope, Christian faith and prayer are the only defenses against Slenderman.

If an adult—the leader of a church, no less—can give credence to Slenderman stories as if they were eyewitness accounts, it's no wonder that some children may as well. Acting out a scene or scenario from a story or an urban legend is actually fairly common. Folklorists call this sort of behavior ostension or legend tripping, and it is an activity shared by ghost hunters who (sincerely or jokingly) walk around reputedly haunted locations, as well as people who go into a dark bathroom, stand in front of a mirror, and call out for Bloody Mary. In many urban legends there's an element of what's sometimes referred to as proof: proving you have the nerve to do something daring. In the case of Bloody Mary legends, for example, it's usually girls proving to themselves and their friends that they're not afraid to go through with a test of courage: Calling Bloody Mary's name three (or seven, or thirteen) times while standing in front of a mirror in a bathroom. If you do it right, or if you have enough faith, she is said to materialize in the mirror.

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According to police and news reports, the reason for the Wisconsin stabbing was very similar: In this case the girls were trying to prove (to Slenderman and to each other) that they had the courage to stab the victim and kill her. Once the act was done, the girls believed Slenderman would appear in front of them and lead them to his mansion, rumored to be hidden in nearby woods. It's a classic example of ostension. There's nothing unusual or inherently pathological about acting out fictional stories and legends. It's similar to the cosplay ("costumed play") found among fans of science fiction and fantasy, where people dress up and act out scenes from films and TV series such as *Star Wars*, *Star Trek*, *Harry Potter*, and so on. Of course with tens (in some cases hundreds) of thousands of fans, a small percentage of them may, because of mental illness, the influence of drugs, or for some other reason, take this fantasy world too far and have difficulty separating fact from fiction.

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IN MEMORIAM: Rob Nanninga, Skeptic Leader and Editor

Jan Willem Nienhuys

On May 30, 2014, skeptic Rob Nanninga, founding member of the Netherlands skeptic group Skepsis and editor-in-chief of its periodical *Skepter*, died at age fifty-eight. No one else had so much influence on Skepsis, both by setting an example and by his method of work.

Rob Nanninga (his official name was Roelof Hendrik Nanninga, but from childhood on everybody called him Rob) was born August 6, 1955, in Groningen in the north of the Netherlands. After finishing high school, he attended a teacher training college, and obtained a diploma as a high school teacher of Dutch and English.

At the time CSICOP was founded in the USA, in 1976, Rob got involved in what one might call a skeptic discussion club. Actually, it was some sort of school project of the college. This was at the time that Uri Geller attracted attention with his spoon-bending act. Rob used to tell the other club members that he knew exactly how Geller did it, but—in style with magic traditions—he kept the method secret.

The Groningen skeptic club remained active for a long time. Rob often took the initiative. One club member (who contributed the following story) said that Rob was very good at making others enthusiastic. Rob took the initiative in many Skepsis investigations and experiments, such as the pendulum experiment (1992, candidates had to detect the presence of a precious object in closed boxes) and the astrotest (1995, http://www.skepsis.nl/astrot.html), where about forty-four experienced astrologers had to match seven extensive life and personality descriptions to the corresponding birth dates, and two muscle tests (2005, 2006) where the candidates claimed that they could diagnose the contents of small bottles by the so-called O-ring test.

In 2004 the Dutch minister of health publicly announced that he thought

homeopathy was silly. A spokesman of an association of lay homeopaths challenged him. If the minister would be so kind as to just try out the effect of Sulphur 200C, namely severe itch and hot flushes, he would change his opinion. Rob and I objected to an unblinded uncontrolled trial with one test person (who would become subject of public speculation about his state of mind whatever the outcome), and proposed a serious test, properly blinded and randomized with eighty test persons, to be jointly performed by Skepsis and the homeopaths. Rob entered into discussions with the spokesman, who at first thought it a good idea but then backed out. The homeopaths had at first suggested that a single test person would suffice, but later they claimed it was impossible to estimate the success rate in the verum group. Another problem was that supposedly the test subjects would know what symptoms to expect—something that didn't matter when they challenged the minister.

Many people have testified that Rob always remained polite and respectful in his contact with people he disagreed with. When Rob started editing *Skepter*, he also put up a Skepsis website, which he filled mainly with articles

from the magazine *Skepter*, but it also contains an extensive library about cults and new religions. Rob's idea was that the information provided by the magazine should be available for the lowest possible price, both for the subscribers and for the general public. The site attracts about 3,000 views a day, and the magazine has 2,300 paying subscribers. The financial situation of Skepsis is healthy, but Rob shortchanged himself by allowing himself to be grossly underpaid. Actually, he hardly thought about money except when his bank account was empty. He was working on *Skepter* day and night. It's ironic that the enemies of Skepsis claim that we are handsomely rewarded by Big Pharma.

Rob was, in a sense, the skeptic's skeptic. Many skeptics and rationalists have a tendency to preach for the converted, but that wasn't Rob's style. He was strict in his views but mild in his statements, as urban legend researcher Peter Burger wrote to me. He was typically a reasonable and cooperative man.

Rob saw Skepsis as an organization for giving neutral information about dubious pretenses of knowledge. He sympathized with serious parapsychologists, but when they started behaving like charlatans, he got angry. A typical

example was the Therapeutic Touch practitioners. Therapeutic Touch is revamped mesmerism or psychic healing. He proposed that they test their explicit claims with a simple test. When they refused, he henceforth considered them to be commercial frauds.

Rob sometimes explained that when he started on a subject, he often didn't know anything about it, but then he studied it until he knew it thoroughly. You can imagine this was hard work, with sometimes surprising results. For example, he discovered that modern yoga was a result of the introduction of Western body culture and gymnastics in India, starting around 1920. He always worried that he would make a mistake that would cost Skepsis its scientific reputation. After all, Skepsis has a committee of recommendation consisting of prominent scientists.

On the morning of May 30, he was found—seemingly asleep—sitting in front of his computer. The diagnosis was cardiac arrest. I informed the readers of *Skepter* at once. Many have mailed me about how they enjoyed his clear, thoroughly researched articles. The last subject he was working on was the Salvation Army, a Christian sect that rakes in an enormous amount of Dutch government subsidies and strongly discriminates against non-Christians.

The readers of *Skepter* didn't know the sweet and caring side of his character. He was the caretaker to his aged mother, who lived upstairs. Something of this side of his character you can see in the endlessly patient way he interacted with, for example, an astrologer. He had other sides as well. He was very fond of a certain kind of folk music. The Incredible String Band was his favorite, but he liked German neo-folk too. And if you look at our website, with its austere style without frills, then you see something of Rob's personality: a desire to make the plain objective truth stand out as clearly as possible in an otherwise messy world.

Let us try to work in his spirit.

Jan Willem Nienhuys, a retired mathematician, is secretary of Skepsis. He is a Fellow of the Committee for Skeptical Inquiry.

Origin of Mysterious Windsor Hum Identified

Benjamin Radford

Since 2011, a mysterious hum has plagued residents of Windsor, Ontario. It's only one of several mystery hums around the world, including New Mexico's famous Taos Hum. No one was sure of its origin—or even if it really existed. People living nearby complain of hearing an intermittent hum that has been described as a refrigerator motor, a truck engine, or an idling locomotive. It has driven many to distraction and is said to induce headaches, insomnia, and other health effects.

Several investigations have been undertaken. The first report was inconclusive, but part of the mystery has now been solved. In May 2014, a Canadian study confirmed for the first time that the hum is real (and not, for example, an auditory illusion) and identified the source: Michigan's Zug Island, across the Detroit River, the site of heavy manufacturing, including a U.S. steel plant.

No one knows where on the island the sound is coming from. Why is it so hard to find the hum? For one thing, the sound is not constant but instead comes and goes, which makes tracking it difficult. Identifying the source of a sound can be problematic in urban areas where concrete, glass, and buildings can reflect, change, and amplify sound waves. Sources of outdoor sounds are nearly endless, including traffic, trains, power plants, and factories.

It's also possible that no specific source of the hum will be found for the simple reason that there is no single identifiable source—instead it may be that the vibrations are the result of several factors (mechanical, geological, acoustic, etc.), which don't create the hum individually but only collectively and under certain conditions. Thus, for example, if you have a dozen pieces of machinery that are suspected of contributing to the hum, turning one or more of them off at a time may stem the sound, but those machines may only be part of the answer and the hum may return even if steps are taken to muffle those machines.

Canadian officials have handed the new report to their American counterparts and requested that the investigation continue until the precise origin of the Windsor hum is identified and the sound is stopped. As a practical matter that may be a very difficult task, and of course companies with manufacturing plants on Zug Island are unlikely to voluntarily shut down operations for weeks (thus costing millions of dollars) simply to locate a hum. When and if a definitive origin of the sound is located, it may take months or years to figure out how to stop it. It might be as simple as placing some industrial machinery on a specialized vibration-dampening platform, or it may be as complex as overhauling an entire factory or assembly line at the cost of tens of millions of dollars.

In the end, it may not matter where exactly the sound is coming from, since identifying the hum's origin may not solve the problem. Part of the reason the Windsor community hears the hum is that sound carries well over water, so one possible and relatively inexpensive way to stem the infernal Windsor hum might be to simply build a sound-muffling wall around the one-square-mile area of Zug Island to confine the vibrations to the island. In the end, stopping the hum is more important to local communities than spending more taxpayer dollars identifying which specific machine or machines created it.

Chupacabra 'Designer' H.R. Giger Dies

Benjamin Radford

Influential Swiss artist H.R. Giger died May 12, 2014, at seventy-four, injured in a fall at his home in Zurich. Giger, influenced by Surrealist artists including Salvador Dali, is best known for imagery that is often sexual and grotesque, organic yet alien and mechanical. He was most famous for creating the extraterrestrial creature in the 1979 horror film *Alien*, for which he received an Academy Award for Best Achievement in Visual Effects. His work has been exhibited throughout the world, and just last year he was inducted into the Science Fiction Hall of Fame.

But Giger was also influential in a bizarre and little-known way: he unknowingly helped create the Hispanic vampire beast *el chupacabra*, one of the world's best-known "real" monsters, which has been reportedly seen throughout Latin America attacking and sucking the blood out of goats and chickens. Though many people mistakenly believe that the chupacabra has been reported for many decades, it was first sighted in Puerto Rico in 1995.

A woman named Madelyne Tolentino claimed she saw the creature near her house in Canovanas, Puerto Rico, during the second week of August in 1995. She said the creature had large eyes that went up the temples and spread around the sides, was about three or four feet high, walked on two legs, and had thin arms and legs. It had no ears or nose but had a row of distinctive spikes on the spine. This original eyewitness description became the basis for many early images of the chupacabra.

For many years, this original and influential chupacabra report remained a mystery. What, if anything, did Tolentino see? No known animal matched her detailed description. It does, however, look almost exactly like a creature seen by hundreds of thousands of other people right around the same time, in the 1995 science-fiction film *Species*: a movie monster named Sil, designed by Giger.

SICHOV/SIPA/Newscom

Sil and the chupacabra creature that Tolentino described are remarkably similar. Giger's book about his work designing Sil for *Species*, *Species Design*, contains dozens of his sketches and designs showing what would later become the chupacabra. From the creature's distinctive feather-textured spine spikes, to the bipedal stance, to the earless and oblong head, to the oval wraparound eyes and long, thin fingers and limbs. Despite some differences in details, overall the resemblance is clear.

I interviewed Tolentino at her home in Puerto Rico, and she confirmed that she'd seen the film *Species*. In fact, in a 1996 interview that appears in Scott Corrales's book *Chupacabras and Other Mysteries*, Tolentino stated that shortly before her chupacabra sighting she saw "a movie called *Species*. It would be a very good idea if you saw it. The movie begins here in Puerto Rico. . . . [The movie monster] made my hair stand on end. It was a creature that looked like the chupacabra, with spines on its back and all. . . . The resemblance to the chupacabra was really impressive." As I discuss in my book *Tracking the Chupacabra: The Vampire Beast in Fact, Fiction, and Folklore*, both Sil and the chupacabra are not only very similar in morphology but also share identical origin stories.

Thus the original and most influential chupacabra eyewitness in history described a monster she'd seen in a movie as a mysterious beast she encountered in real life. Over time the chupacabra has changed form, and most modern reports are not of the original chupacabra that Giger designed (and Tolentino described) but instead resemble mangy dogs, coyotes, and even raccoons.

It's unlikely that Tolentino intentionally created a hoax that spawned a famous monster. Instead, she simply confused a real-life memory with something she experienced in a film—a common (and harmless) phenomenon known in psychology as confabulation. We all do it, usually unknowingly, but most of us don't spawn monster mysteries. In a case of truth being stranger than fiction, H.R. Giger helped create a legend that is among the world's best-known monster mysteries.

Joe Nickell, PhD, is a skeptical cryptozoologist, Chautauqua Lake Bigfoot School graduate, and author of *Tracking the Man-Beasts*. He has investigated such hairy manlike creatures as the Honey Island Swamp Monster (Louisiana), The Skunk Ape (Florida panhandle), Bigfoot (in regions of several states, including Bluff Creek, CA, New York's Adirondacks, and Mt. Rainier, WA and elsewhere), and the Yowie (Blue Mountains of Australia).

Bigfoot at Mount Rainier?

As part of the Pacific Northwest, Washington State is a prime location for reports of Sasquatch—usually known since 1958 as Bigfoot. In one study (Nickell 2013, 15), involving 1,002 reports from 1818 to November 1980 (Bord and Bord 2006, 215–30), Washington had the greatest number of incidents: 110 (followed by California, 104; British Columbia, 90; and Oregon, 77).

In October 2013, led by a professional guide, I visited Mount Rainier and its vicinity, the locale of numerous alleged sightings, track discoveries, and photographs of the elusive creature (Bord and Bord 2006, 194, 259; Green 1978, 93, 392–95). Some screams—assumed without justification to be from Bigfoot—have also been recorded in the area (Green 1978, 393–95).

The Bigfoot Bear

Bigfoot tends to be spotted in bear territory, to mimic a bear's behavior, and even to resemble a bear when—as it does in alert mode, especially—it stands upright (Nickell 2013). Consider these cases:

- In the autumn of 1912, near Oakville (between Mount Rainier and the Pacific) a woman saw a tall, bearlike/apelike creature looking in the window of her small ranch house (Green 1978, 389–90). Was it actually a bear, as she first thought?
- In about 1948 (as recalled many years later), a man named Clarence M. Foster was at Mad Lake (northeast of Rainier) when he saw what some have concluded was a Bigfoot. Foster saw it on the opposite shore and described the creature as thin, six feet tall, and squatting with its "arms" in the water. Foster first "thought it was a man but it seemed to be covered with black hair. Later he went to where it had been and could find no sign of a camp" (Green 1973, 15).
- In the summer of 1964, a prospector from Missouri was camping between Spirit Lake and Mount Adams (i.e., approximately due south of Mount Rainier) when he woke to see a seven-foot-tall man-beast, a "dirty brown" in color. He saw it for only "about thirty seconds" and only from the back, but, he recalled, "his legs seemed stuffy in comparison to the rest of his body" and "his front legs or arms" seemed to swing from side to side (Green 1973, 28). He insisted it was not a bear, but I suspect he had not previously encountered one standing upright. Apparently, as bears so often do (Herrero 2002, 116–24), this one had come into his camp looking for food.
- More recently (date not given), two bow hunters near Orting (northwest of Rainier) saw what they thought was a Bigfoot approximately three hundred yards away and watched it for a while. It reportedly stood upright, had a simian appearance, and was covered with black fur. One pro-Bigfoot source commented that "If they had been watching this creature with only their naked eyes, we might think it was just a bear, but since they used binoculars, that explanation is unlikely" (Davis and Eufrasio 2008, 91–92). Actually, binoculars do not necessarily prevent a misidentification at such a distance. The fact that the animal was stand-

Figure 1. "Bigsuit" outside Mount Rainier National Park. (Photo credit: Steve Wilson)

ing upright may have led them to conclude it was not a bear but a Bigfoot, and that is what they then saw.

In short, can we be certain that eyewitness reports of hairy creatures, even if seen standing or briefly walking upright, are really Bigfoot—or could a witness be fooled by a bear? This could be not only because of poor viewing conditions (caused by distance, vegetation, darkness, etc.), but also because he or she has Bigfoot on the mind. My late colleague, the psychologist Robert A. Baker, called attention to "the power of expectation and how our activities and mental sets can influence our perceptions and beliefs" (Baker and Nickell 1992, 135–39).

On the Trail at Mount Rainier

At Mount Rainier National Park in late October 2013, accompanied by experienced guide Diann Sheldon, I spoke with an official at the park entrance (Challup 2013) who told us that the most active alleged Bigfoot sighting area was around Reflection Lake. He also informed us of someone dressing as Bigfoot—what I call "Bigsuit"—in outlying areas, specifically along Skate Creek Road (Forest Service Road 52, which we intersected coming and going). (See Figure 1.)

Sheldon took me into definite bear country—snow-covered trails at about 5,500 feet elevation on Rainier. There she pointed out some bear "scat" (droppings)—which, she observed, showed the bear had been feeding on the mountain ash berries that were common there. Farther on, we came across more such scat. Later, below the trails, we ate at the Paradise Visitor Center and Inn where I spoke to park rangers and volunteers.

One of the latter (Hollinger 2013) told me how, the previous summer, she had encountered a standing bear on Rainier, just fifty feet away from her—for what *seemed* a very long time! She pointed out that, with its front legs hanging at its side like arms, such a bear could resemble Bigfoot—especially if it was looking directly at the observer so that its face seemed flatter. She pointed out also that Mount Rainier black bears were often brown or cinnamon colored, which could make them seem even more Bigfoot-like.

She also stated that, at ranger housing at the Sunrise Visitor Center across the mountain, it was not uncommon for bears to be seen standing upright and looking in the windows in their perpetual search for food (Hollinger 2013). This common bear behavior (Nickell 2013) is also frequently reported of Bigfoot (e.g., Bord and Bord 2006, 224, 239–41, 251, 264, 271–72, 300, 303; Green 1973, 28, 38, 58; Green 1978, 252–53, 389–90). Before leaving Mount Rainier we staked out Reflection Lake on the mountainside (Figure 2), but no "Bigfoot bear" appeared.

Figure 2. Author searches, in vain, for Bigfoot at Reflection Lake, Mount Rainier National Park. (Author's photo by Diann Sheldon)

Wild Creek Photos

Perhaps the most notorious "evidence" of Bigfoot in the Mount Rainier area consists of several photographs allegedly made in 1995 at Wild Creek in the nearby foothills by a forest patrol officer. However, numerous red flags are noted—as by Bigfoot authors Janet and Colin Bord (2006, 195) who state:

> With any event where the subject is known to be elusive, clear photographs are naturally suspect. In this case we note that Bigfoot seems not to have moved from shot to shot, which seems unlikely, and the photographer must have been a very brave man indeed, to have stayed around long enough to shoot 14 photographs of an unpredictable monster. Also problematic about the Wild Creek photographs is the lack of good scale, the sense that computer manipulation software is involved, and that the supposed "forest patrol officer" has never been identified.

This lack of provenance for the photos is alone highly suspect (having served as a warning sign on the introduction of such notorious fakes as the Shroud of Turin, the Jack the Ripper diary, a forged copy of Lincoln's Gettysburg Address, and many other artifacts I have exposed as fakes [Nickell 2009, 42, 67–79, 167]).

Bigfoot in Rainier's Crater?

Among the most far-fetched of alleged Bigfoot tales is one dating from 1895, but then—it may not be about Bigfoot at all!

The story appears in snippets (e.g., Lee 2013) in works billing it, for example, as a "fantastic encounter with what appears to be Bigfoot" (Dennett 2001, 36). Written by Mount Rainier explorer Major E.S. Ingraham in 1895, "The Old Man of the Crater" tells how he and an unnamed companion "were exploring the steam-caves at the time of my second visit to the crater of Mt.

Rainier." There, he spied some "peculiar marks" on the cave floor, along with a strange glow in the atmosphere. He determined to return later, and did so when his "three bedfellows were sound asleep."

Creeping back into the cave, Ingraham says, he encountered "a figure of strange and grotesque appearance . . . writhing and floundering very much as a drowning man would do. . . ." He continued:

> Its shape was nearer to that of a human being than of any other animal. The crown of its head was pointed, with bristled hair pointing in every direction. The eyeballs were pointed too; and while they appeared dull and visionless at times, yet there was an occasional flash of light from the points. . . . The nails of its fingers and toes were long and pointed and resembled polished steel more than hardened cuticle. I discovered that the palms of its hand and the soles of its feet were hard and calloused. In fact the whole body, while human in shape . . . seemed very different in character from that of the human species. (Ingraham 1895, 42, 44, 46)

When the light formed "an arch" above and between them, Ingraham soon found himself in a sort of telepathic communication with the creature, and for the next hour "received impressions." However, when the Old Man of the Crater commanded Ingraham to follow him, he instead "broke the spell" and returned to his sleeping companions (Ingraham 1895, 46, 48).

This is clearly not about Bigfoot. Ingraham not only omits reference to the creature being covered in hair, but he goes on to say (1895, 48):

> This is no myth. The old man told me of his abode in the interior, of another race to which he belonged and the traditions of that race; of convolutions and changes on the earth long, long ago; of the gradual contraction of a belt of matter around the earth until it touched the surface hemming in many of the inhabitants and drowning the remainder, and of the survival of a single pair. All was shut out and the atmosphere became changed. Gradually the remaining pair was enabled to conform to the new order of things and became the parents of a race which for the want of a better name I will call Sub-Rainians. This Old Man of the Crater had wandered far away from the abode of his race in his desire to explore. Far away from my home we had met, each out of his usual sphere.

Rather than Bigfoot, Ingraham is describing a creature of *myth*, while declaring otherwise as an element of *verisimilitude* (or semblance of truth), often used by writers—Poe for instance—to urge the reader to accept the fanciful as real. The creature is from an antediluvian[1] (pre-Flood) world of which a pair (like Adam and Eve) survive the deluge to repopulate the species. Calling them the "Sub-Rainians" suggests subterranean, that is, the Underworld, the realm of the dead. And Ingraham's caves ostensibly lead down into the fiery interior of the volcano, an unmistakable suggestion of death and Hell.

But what is the nature of this fantasy? Did it begin, say, with a hallucination caused by high-altitude oxygen deprivation—a "visionary" experience? Or was Ingraham merely penning a tale in the science-fiction tradition of hollow-earth adventures, like Jules Verne's 1870 *Journey to the Center of the Earth*, as a whimsy for his readers? Could it even be a Masonic allegory of the Secret Vault (in Freemasonry, a subterranean repository of secrets that in the end, remain hidden)?[2] E.S. Ingraham was, in fact, a Freemason (Sherman 1890, 66). Among their secrets, Masons teach that death—both literally and figuratively—is a continuation toward perfection (Macoy 1989, 117–18).

Whatever Ingraham intended, his creature is not Bigfoot as traditionally portrayed. Yet the two entities do have something in common: both are, as far as current evidence suggests, imaginary. ■

Acknowledgments

In addition to individuals cited in the text, I am grateful to former CFI librarian Lisa Nolan for extensive research on E.S. Ingraham.

Notes

1. This is a term of significance in Freemasonry (Macoy 1989, 418), the relevance of which will be noted presently.

2. In Freemasonry the ritual of the Secret Vault is part of the Royal Arch degree, so Ingraham's use of the words *vaulted*, *arch*, and the like seem to take on allegorical significance. (Masonry has been defined as "a peculiar system of morality veiled in allegory and illustrated by symbols" [*Masonic Bible* 1964, 26].) The "peculiar marks" suggest *Masons' Marks* (inscribed signs by which Masons are distinguished) and the "mysterious glow" could signal *Darkness Visible* (which in Masonry serves "only to express that gloom which rests on the prospect of futurity" [Macoy 1989, 479]—a theme indeed of Ingraham's tale). (See Nickell 2001, 227–33.)

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[THINKING ABOUT SCIENCE MASSIMO PIGLIUCCI

Massimo Pigliucci is professor of philosophy at the City University of New York, a fellow of the American Association for the Advancement of Science, and coeditor (with Maarten Boudry) most recently of *Philosophy of Pseudoscience: Reconsidering the Demarcation Problem*. His essays can be found at ScientiaSalon.org.

Evidence in Science

As everyone surely knows, New York City is the center of the world, which is why the annual public science extravaganza that takes place there is known as the World Science Festival. Since it happens—by a combination of intelligent design and serendipity—that I live in the city, I was privileged to witness (indeed, to participate in behind the scenes, as I'll explain in a moment) a lively conversation between physicist Brian Greene, science author Jim Baggott, and historian of science Peter Galison. The topic of the conversation was what counts for evidence in the natural sciences, and more specifically whether some strands of contemporary theoretical physics have become so detached from empirical evidence that they look more like metaphysics than physics.

Greene, of course, is famous for being a strong proponent of string theory (for instance in his captivating book *The Elegant Universe*), and he is the organizer of the festival. Baggott recently authored *Farewell to Reality: How Modern Physics Has Betrayed the Search for Scientific Truth*, so you can see where this is going. Jim had asked me and physicist Peter Woit (another strong critic of string theory, author of *Not Even Wrong: The Failure of String Theory & the Continuing Challenge to Unify the Laws of Physics*) to check his arguments from both the point of view of philosophy of science and theoretical physics before the event. That task accomplished, I then sat in the audience at the festival, ready to enjoy what I was sure was going to be a very enlightening discussion.

As most readers will agree, what distinguishes science from mathematics (or metaphysics!) is that its theoretical structure is always in close contact with empirical evidence. At several points during the history of science, of course, either theory or evidence got temporarily ahead of the game: for example, geologists had compelling evidence for continental drift before they were able to come up with a theoretical model that could account for it, and the standard model in physics had predicted the existence of the Higgs boson decades before it was actually discovered.

So far so good, then. The problem, according to Baggott (and Woit and Lee Smolin, author of *The Trouble With Physics: The Rise of String Theory, The Fall of a Science, and What Comes Next*) is that the fundamental physics community has been entertaining the notion of string (and superstring and M) theory for several decades, and we still don't have any sensible way to test whatever novel predictions are made by the theory. Indeed, things have actually gotten worse over time, as theoreticians now estimate that string theory is actually better thought of as a very large family of theories (a "theoretical landscape"), comprising about 10^{500} variants. This is an embarrassment of theoretical riches, with hardly a hope, at the moment, to winnow it down to a manageable number—let alone to *the* ultimate theory of everything.

This is an embarrassment of theoretical riches, with hardly a hope, at the moment, to winnow it down to a manageable number—let alone to *the* ultimate theory of everything.

Greene, of course, had heard all of this before—several times in the last few years, in fact—and his reaction was interesting. He actually admitted to all the problems Baggott was mentioning (as far as I could tell, Galison's contribution to the debate was rather marginal) but kept coming back to a couple of refrains. First, string theory is "the only game in town"; second, individual scientists are free to work on whatever they like, so who's stopping bright young physicists from jumping

ship and trying something else?

I found both points somewhat disingenuous, especially coming from a major player like Brian Greene. To begin with, string theory is decidedly not the only game in town, since people have been working on alternative ways of doing what it is supposed to accomplish: the unification of Einstein's general relativity and quantum mechanics, which currently make predictions about certain physical phenomena that are at odds with each other. What is true, however, is that these alternatives to string theory (like loop quantum gravity, championed by Smolin, among others) are so far underdeveloped, and they do sound just as strange and as difficult to test as the main pretender to the throne.

Which brings me to the second point: Greene's idea of scientists as individual free agents operating within the broader market of ideas bears little resemblance to what I have experienced as a practicing scientist. If you want to pursue a career as a scientist in the twenty-first century you need to be hired as full-time faculty by a university with sufficient resources for you to set up your laboratory, and you have to continuously generate large amounts of funds via grants, usually provided by federal agencies who rely on panels of peer reviewers to rank their funding priorities (and constantly have to beg Congress to increase their clearly insufficient budgets).

As Smolin pointed out in *The Trouble with Physics*, string theory was considered so promising back in the 1980s and 1990s that huge amounts of grants and a large number of university hires went into furthering the field. While this trend now shows signs of slowing down—presumably, precisely because of increasing disappointment with what the theory has actually delivered—it at least partially explains, on sociological grounds, why we don't have many other alternatives to play with at the moment, and why Greene's ideal scientist is a figment of his imagination rather than a reflection of actual scientific practice.

So, is string theory "not even wrong," as Woit put it in the title of his book (inspired by a quote from Wolfgang Pauli, originally uttered in a different context)? We don't know. Has it crossed the line into speculation untethered to empirical evidence without knowing how to come back, as Baggott alleges? Again, it's hard to say. But these are certainly interesting times for theoretical physics, and they do provide fodder for further thinking about the nature of science itself. ■

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Sheaffer's "Psychic Vibrations" column has appeared in the Skeptical Inquirer for more than thirty years; its highlights have now been published as a book (Create Space, 2011). Sheaffer blogs at www.BadUFOs.com, and his website is www.debunker.com.

Carl Sagan, Laurance Rockefeller, and UFOs

UFO researcher Shepherd Johnson of Virginia was researching the late Carl Sagan's papers at the Library of Congress in Washington, D.C. He found a fascinating attempt by Laurance Rockefeller to draw Sagan into his pro-UFO advocacy and posted this to the Facebook group UFO Updates. The American billionaire Laurance Rockefeller (1910–2004) was the son of John D. Rockefeller, Jr., and the brother of Nelson Rockefeller. His UFO "disclosure initiative" is well-known in UFO circles. In the words of UFO researcher Antonio Huneeus (http://goo.gl/kcXntz),

> Throughout the 1990s, billionaire philanthropist Laurance S. Rockefeller (1910-2004) sponsored and funded a number of UFO-related projects. This has come to be known as the Rockefeller UFO initiative since in some cases they went beyond funding and included an actual lobbying effort to the Clinton White House, undertaken by Rockefeller himself and his lawyer Henry Diamond, in the early and mid-90s.
>
> A copy of the (UFO) Briefing Document was sent by Laurance Rockefeller to the White House Science and Technology advisor, Dr. John Gibbons, on February 29, 1996. In his cover letter, released under the Freedom of Information Act together with many other documents related to the Rockefeller UFO initiative, the late philanthropist wrote: "I sponsored this report because it seemed useful to bring together the most credible evidence about UFO sightings in the form

> of eyewitness reports, official statements, and scientific views. While I do not necessarily agree with every finding and conclusion, I do believe that the evidence presented indicates that this subject merits serious scientific study. Toward that end, I hope that our government, other governments, and the United Nations will cooperate in making any information they may have available.

There are still conspiracy theories going around about Rockefeller's UFO "disclosure initiative" being suppressed by shadowy powers (http://goo.gl/piIk2J). In addition to funding UFO research, Laurance Rockefeller also funded research into crop circles and ESP.

In a letter to Sagan dated October 17, 1996, Rockefeller wrote,

> We continue to share your interest in assessing the probability of extraterrestrial intelligence. We believe that while the approach through radio telescope inquiry might prove useful, other inquiries might be productive as well. As you well know, there is substantial anecdotal evidence on the existence of ETI and UFOs and little or no evidence of radio signals. Thus, we believe other avenues are worthy of serious scientific inquiry.

SETI has no data, says Rockefeller's argument, but UFOlogy does. Sagan's reply, dated November 6, 1996, was brief and pointed:

> My view is that no amount of anecdotal evidence, unsubstantiated by physical evidence, is worth a single substantive bit of physical evidence. A million reports that the Earth is flat has no veridical value on the shape of the Earth.

Images of the original letters are available on my *BadUFOs* blog entry of April 4, 2014 (http://goo.gl/pL30AM). Not many people would be willing to "tell off" a billionaire seeking their participation in a project, but here we see that Sagan was! Just six weeks later, on December 20, 1996, Carl Sagan died. Thus this was among his very last letters.

* * *

As "UFO Realists" (meaning those of us who think that facts matter when it comes to evaluating UFO claims—skeptics and "skeptical believers" alike), we all realize that at least some dramatic UFO reports are misperceptions of objects burning up upon entering (or, in the case of satellites, reentering) Earth's atmosphere. We know, for example, about the Zond IV satellite reentry in 1968, widely seen across the United States, and widely reported as a UFO, with "impossible details" added to what was actually visible (http://goo.gl/8vDYSl).

Ted Molczan of Toronto, Ontario, is perhaps the world's leading civilian

authority on observing Earth satellites and calculating their orbits. He is a principal contributor to the SEESAT list, the main online forum of the world's serious amateur satellite watchers (http://www.satobs.org/). Whenever observers disagree about which satellite has been seen, a pronouncement from Molczan will usually settle it.

In April 2012, Molczan was consulted about the famous Yukon "Mothership UFO" reports of December 11, 1996, which were touted as a "Top Ten" UFO case and strongly promoted by Stanton Friedman, the "Flying Saucer Physicist." Molczan discovered that it matched perfectly with the flaming reentry of the second stage of the rocket that had launched the Russian satellite Cosmos 2335 earlier that day. I wrote a column about this with emphasis on the spurious details that had been added to the reports (SI, September/October 2012).

Previously to this, Molczan had little interest in, or exposure to, UFO reports, although a few of us skeptics had been in occasional contact with him. But this incident piqued his curiosity, and he began to investigate: How many other reported UFO cases can be tied to satellite reentries? Apparently, the answer was "lots," and the result was this list, the first of its kind. It hopes to list every natural satellite reentry (a naturally decaying orbit as opposed to controlled reentries) that has been visually observed and reported. It now runs to twenty pages of reports. Not all of the observations are taken from UFO reports. Many are from scientific observers or press reports. Also, it does not include meteor sightings, no matter how spectacular. So, famous bolide sightings like the Great Lakes Fireball of December 9, 1965 (aka the "Kecksburg UFO Crash," http://debunker.com/Kecksburg.html) are not on the list.

Molczan has promised to keep the list updated as new information becomes available. The latest copy will always be here: http://goo.gl/TD8FWn.

Molczan recently wrote,

> I identified three more 1980's sightings just last night, all of them unsolved Australian UFO cases. That brings to 54 the number of UFOs I have identified as re-entries, beginning with the 1996 Yukon case nearly two years ago.
>
> The comprehensive set of web pages that I intend to be the final product of this research will include general information on the science of re-entries and reports on selected individual sightings. A working prototype of the latter is the identification of David Biedny's childhood UFO sighting in Venezuela in 1974, which he and his brother disclosed on the Paracast in 2006: (http://goo.gl/0irWOX).

So at least fifty-four "UFOs" have become "IFOs," thanks to Molczan's efforts. And that "working prototype" page is pretty darn impressive! So if you are researching a historical UFO case, you'd do well to check this list to see if Molczan has anything about it. And a hearty cheer for Ted Molczan for all this great work!

* * *

The Unarius "Academy of Science" is well-known in UFOlogy as one of the few surviving institutions from the Contactee glory days of the 1950s. It was founded in 1954 by Ernest L. Norman (1904–1971) and his wife Ruth E. Norman (1900–1993, sometimes fondly known as "Spacecraft Ruthie"). The organization teaches an "interdimensional science of life" based upon "fourth-dimensional" physics principles. As seen in this 1989 video (http://vimeo.com/15858588), the organization boldly predicted a mass landing of space aliens in 2001. Unarius suffered a keen embarrassment when that failed to happen.

Ernest L. Norman claimed to be a psychic and to channel cosmic messages. He claimed to be the reincarnation of Jesus as well as the earthly incarnation of the archangel Raphael. Ruth claimed to be the incarnation of the archangel Uriel as well as the reincarnation of Confucius, Mona Lisa, and Poseidon (http://goo.gl/WiYbtl). There was a whole lot of carnation going on. After Ernest's death, his wife concentrated on the show business aspects of spreading the message of interplanetary peace and love.

But lest you think of Unarius as an irrelevant relic, let us point out that there was a Unarius Film Festival in Los Angeles May 31 and June 1, and it was reported to be selling out!

> Bootlegged and coveted by collectors for decades, these films have never before been presented as works on the big screen—until now. This full-immersion weekend includes core Unarius members onstage for live Q&As, the world theatrical premiere of Unarius's 1979 16mm masterwork *The Arrival*, highlights from their massive archive of public access videos—plus a Unarius costume exhibit, pop-up reading room, workshops, and tea house on Cinefamily's back patio. (http://goo.gl/vRMBDL)

There are some theatrical trailers on that page for Unarius films, and they are so marvelous that I feel they threaten to outshine even Ed Wood's classic film *Plan 9 from Outer Space*. There is talk of repeating the Unarius festival in other cities.

Here is a photo I took of a Unarius "Conclave of Light" in 2005:

A majorette leads Unarius's procession of the "Interplanetary Ambassadors."

[NOTES ON A STRANGE WORLD MASSIMO POLIDORO

Massimo Polidoro is an investigator of the paranormal, lecturer, and cofounder and head of CICAP, the Italian skeptics group. His website is at www.massimopolidoro.com.

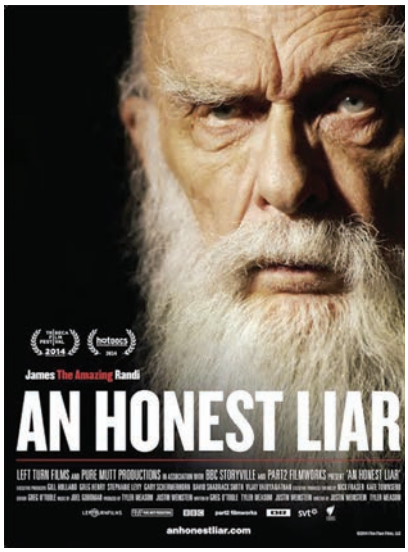
The Amazing Randi Story: Why James Randi Deserves a Biography

With the completion of *An Honest Liar*, the movie directed by Justin Weinstein and Tyler Measom, James Randi's incredible life story is receiving some well-deserved attention. After opening to rave reviews at the Tribeca Film Festival, the film now continues to wow audiences. It recently won the Best Documentary Award at multiple festivals as well as being an audience favorite. The movie will be distributed in theatres across America this fall and then it will probably go abroad. If you still haven't done so, grab the chance to see it as soon as you can.

In this exciting, surprising, and often touching movie, Randi and some of the other characters in his life—from his longtime partner Deyvi Peña to arch-nemesis Uri Geller—share their memories. Though a lot is revealed through recent and archival footage, there is still much more to tell.

It could not be otherwise, for a movie only has an hour and a half to give you a glimpse, however well done and complete, into the life of an extraordinary person like Randi. What is needed now is a complete biography devoted to James Randi's life.

The good news is that the work for what promises to be a lengthy and engaging book has been underway for some time. The original idea belongs to Penn Jillette, of the magic duo Penn & Teller, who in 2005 was able to convince Randi that a biography of his life was needed. Jillette started interviewing him and then involved Kim Scheinberg, who spent several years searching for people and stories, lost documents and long-forgotten clippings. This resulted in hundreds of hours of interviews with Randi and hundreds more with friends and foes going back more than sixty years.



By 2010, the volume of research was overwhelming. Both Randi and Peña, along with his other friends and supporters who have invested time and money for the past few years toward the realization of such a work, asked me to take over and actually write the book.

I had the privilege of being Randi's apprentice in 1989 and 1990. I lived at his house for over a year and we have shared investigations, adventures, research, and, above all, a profound friendship that goes beyond mentor and apprentice.

A movie only has an hour and a half to give you a glimpse, however well done and complete, into the life of an extraordinary person like Randi.

I consider Randi almost as a second father. We never lost touch and we visit each other frequently. He even flew all the way to Italy to attend my wedding, one of his many gifts that I will never forget. Furthermore, being a fan as well of Randi's exploits, I too have collected lots of in-depth research and material on his work for the past twenty-five years. But, apart from all of this and from my role in

James (The Amazing) Randi and author/investigator Massimo Polidoro.

the skeptics' movement, the main reason for which I was asked to take over the actual writing of the book is that, after returning to Italy in 1990, I became a professional writer.

I have published over forty books since then, many of which have been translated in different languages, and at least two I wrote directly in English for Prometheus Books. This means that I have both a deep knowledge of the subject and the tools for turning the book idea into a reality.

This is why, during the past year, I have started going through the material that Kim Scheinberg and Penn Jillette collected and generously shared with me. I spent engaging time in New York with Kim and, while there, I was also given access by Justin Weinstein to the research material that he and his colleagues had put together for the movie. I also spent time again in Florida, going on for days with Randi, through piles of documents, old photos and clippings, and recording everything.

This, then, is the situation at the moment of writing these notes. I have announced at the Amazing Meeting in July that I have started working on Randi's biography. Kim will share the credit with me and Penn will write an introduction. We still haven't looked for a publisher, though, and the goal is to find one by the end of the year. If anyone reading this is a publisher or knows someone who works in the publishing business, this is the moment to think about getting the rights for this book.

However, until then, since I make my living from my writing, I can only devote so much time to the project until we find a way to sponsor my work. One possibility is to launch a fundraising campaign through some crowd-funding website. Another one is to sell single parts of the book, as soon as they are ready, on Amazon through the Kindle Direct Publishing system.

There is still time to decide how to proceed, and things may mature soon. In the meantime, if you want to receive news, sample chapters, and other material related to the biography, you can send me an email at massimopolidoro1@gmail.com. I will keep you updated. ■

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The Uncomfortable Science of Athletic Achievement

No doubt older than documented history, the nature versus nurture debate continues to perturb every intellectual nook and cranny of modern society. The origins of intelligence, artistic prowess, beneficence, and antisocial proclivity remain popular and well-studied topics. But nowhere does the conundrum's obscurity haunt us with greater urgency than in the winner-take-all context of sport.

Athletic performance is surely influenced by genes. But does DNA dominate the calculation so thoroughly as to render potential environmental factors like upbringing, education, passion, and perseverance all but irrelevant? If so, why should we continue to reward our student, Olympic, and professional athletes, for example, with honors, extravagant riches, and adulation never truly earned?

In my experience as a trainer and generally active person, for what it's worth, athletes at every common fitness level tend to credit their abilities and successes (or lack thereof) to either inherited traits or training, depending on which best validates their personal narratives. In short, those who succeed attribute hard work or shrewd programming, while those who fail concede to innate limitation.

By contrast, as long-time sports writer David Epstein recently observed, "ignoring gifts as if they didn't exist" is far more customary within the loftiest echelons of high-stakes sports

(Epstein 2014). But why should that be true in contexts where extraordinary physical attributes are so starkly evident?

Perhaps elite athletes still train in the long shadow of pioneering research. In the 1970s, for example, a graduate student at the University of Waterloo named Janet Starkes began to wonder why certain physical "hardware" often failed to explain expert performance. Consider reaction times, for instance. Starkes knew that, contrary to popular intuition, both highly successful athletes and the general public require one fifth of a second to react to visual stimuli.

So in 1975 she invented the modern sports "occlusion" test. Starkes asked competitive volleyball players to view numerous slides depicting game situations for only a small fraction of a second. The athletes were then instructed to judge in each instance whether a ball had been depicted in the frame.

At sixteen milliseconds, the flash was too rapid for anyone to actually recognize the ball or its absence. But not only were the best players somehow able to identify it, they could glean enough extra information to know when and where the pictures were taken. After earning her PhD, Starkes continued occlusion testing at McMaster University and produced similar results working with the Canadian national field hockey team

(Starkes 1987).

Expanding on Starkes's methods, Queensland researcher Bruce Abernathy equipped tennis players with goggles, and cricket batters with lenses, that turned opaque or blurred just before their opponents struck or threw the balls. Similar to Starkes, he found that elite players needed less time (and less visual information) to accurately predict the play's immediate future (Mann et al. 2010).

After many sessions of practice, Abernathy concluded, elites are better able to "chunk," or unconsciously group, critical bits of visual information into meaningful patterns. They can accurately predict, for example, whether balls would be returned to their forehands or backhands based only on the positions of their opponents' wrists or elbows prior to contact with the ball.

Thus, many sports researchers have come to believe that exceptional skills are not innate to athletes, as "hardware" is to machines. Rather, they conclude, such proficiencies are unconsciously acquired, or "downloaded," like "software" after many hours of intense practice.

How many hours? Some say about 10,000 will do the trick. In 1993, psychologists led by K. Anders Ericsson—the now-famed "father of the 10,000 hour (or ten year) rule"—analyzed data on three groups of violin students at the Music Academy of West Berlin (Ericsson et al. 1993). Accumulated practice from age eight were tallied for likely international soloists (best of the best), probable symphony orchestra members (very good), and soon-to-be teachers (not so great).

Every violinist had dedicated an impressive fifty-six hours of general weekly practice to his or her craft, on average. But the groups distinguished themselves in two important respects. First, members of the top two groups spent about twenty-four hours per week in more intense *solitary* practice, compared to the would-be teachers' nine. Second, better students made an earlier start of it. By age twelve, future soloists had topped future teachers by about 1,000 hours of solitary practice. By age eighteen, they had accrued, on average, 7,410 hours relative to 5,301 for orchestra members and 3,420 for teachers.

Researchers later found that, regardless of instrument, expert musicians tended to accumulate about 10,000 hours of practice by age twenty. They also spent far more time engaged in grueling "deliberate" practice—usually solitary. Quick to exploit any potential sound bite, the popular media extrapolated the 10,000 hour rule to cover any conceivable discipline, including sports performance.

Epstein, on the other hand, remains less impressed. Ericsson's seminal violin study, after all, included very few students, each of whom had already achieved much in his or her field. "When most of humanity has already been screened out of a study before it begins," says Epstein, "the study often has little or nothing to say about … innate talent." It should be noted that Ericsson himself never employed the term "10,000 hour rule." Indeed, he has since emphasized that the number represented only an average figure utterly incapable of predicting any individual's potential.

By contrast, the genetic influence has been brightly illuminated by two interrelated aspects of modern culture. First, technology has greatly expanded the customer base of big-time sports. No longer reserved for the rich, the idle pastime of sports spectatorship now tempts anyone who can afford an electronic screen or a cheap ticket to a packed stadium. Second, huge winner-take-all purses and their attending commercial opportunities have transformed the participant class as well, supplanting eye-of-the-tiger battlers with physical mutants more resembling comic book superheroes, villains, and even monsters.

During the early decades of the twentieth century, top sports coaches sought the fit average Joes because they believed that typical, well-rounded physiques were the ideal standard for all types of competition. But as both audiences and incentives swelled, we had only to turn on our televisions to witness a profound anatomical renovation.

During the 1990s, Australian anthropometrists Kevin Norton and Tim Olds began collecting data from 1925 forward on athlete body types. As the culture changed, they discovered, a "Big Bang" pattern of body types began to emerge (Norton and Olds 2001). Elite sprinters, gymnasts, divers, and figure skaters got shorter, for example, while volleyball players, rowers, and football players got taller.

Norton and Olds soon developed the "bivariate overlap zone" (BOZ) measure, intended to predict the like-

lihood that a randomly chosen man or woman would possess a body minimally worthy of elite competition. In terms of appropriate height and weight alone, BOZ analysis revealed that just 28 percent could play professional soccer, 15 percent professional hockey, and 9.5 percent as forward with the Rugby Union. In the NFL, one more centimeter of height or 6.5 pounds of extra weight translated into $45,000 of additional income.

No doubt, the genetics of race affect sports performance too, though perhaps not as popularly imagined. For instance, we know that certain Africans, or persons of recent African ancestry, do have an advantage based simply on their home continent's greater genetic diversity.

Researchers have also discovered that an athlete's geographic origins can help him or her get away with testosterone doping (Schulze et al. 2008). A common sports urine test measures a donor's "T/E ratio," or relative concentrations of both testosterone and epitestosterone. Normally, doping upsets the typical one-to-one balance. But cheaters who possess two copies of a particular version of the UGT2B17 gene will always pass. Interestingly, a full two-thirds of Koreans, yet only ten percent of persons of European ancestry, meet that criterion.

By contrast, some athletes' genes might make them appear as if doping, even when they are not. Take former Finnish cross-country skier Eero Mantyranta, for example. In the 1964 Winter Olympics, Mantyranta won two golds and one silver medal. In the 15K race, he won by an unprecedented forty seconds, and in the 30K, he bested his competition by over a minute.

At times during his career, Mantyranta was falsely accused of blood doping with a synthetic form of the erythropoietin hormone, or EPO, which signals the body to produce more red blood cells. Indeed, Mantyranta's red blood cell count was often 65 percent higher than average. More red blood cells, of course, means more oxygen-carrying hemoglobin, and an increased capacity for sustained exercise.

Geneticist Albert de la Chapelle decided years later to examine Mantyranta's family tree. Of ninety-seven relatives tested, twenty-nine had extremely high hemoglobin levels. After much searching, genetic analyses finally revealed a single spelling change at position 6002 of the erythropoietin receptor gene, or EPOR for short, on the nineteenth chromosome—this "stop codon" led the twenty-nine relatives' bone marrow cells to naturally overproduce red blood cells (De la Chapelle et al. 1993).

This condition was passed down to Mantyranta in autosomal dominant fashion, meaning that in this case only one copy of the mutated version was required. Unsurprisingly, de la Chapelle could never convince Mantyranta of his biological advantage. Mantyranta argued to his dying day that his exceptional success sprang only from steely determination.

Of course any number of complex traits related to sports performance could be and probably are genetically influenced. The philosophical determinist in me tends to believe that even discipline and desire—as well as the ability to quickly "chunk" information—are in fact products of genetic "hardware." But maybe that's just my personal narrative seeking excuses for a lifetime of less-than-stellar athletic achievement.

In any case, some will take tremendous, if unwitting, comfort in the fact that we might never even draw near to a full understanding of the human genome. And, as Epstein concedes, "humanity will continue to rely on chance and sports will continue to provide a splendid stage for the fantastic menagerie that is human biological diversity." ■

Of course any number of complex traits related to sports performance could be and probably are genetically influenced. The philosophical determinist in me tends to believe that even discipline and desire—as well as the ability to quickly "chunk" information—are in fact products of genetic "hardware."

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[SKEPTICAL INQUIREE BENJAMIN RADFORD

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Crop Circles: A Not-So-Convincing Case

Q: I wrote a letter to CSI asking them to investigate crop circles to determine if they are a hoax. I looked up crop circles on the web and they state that humans made all crop circles. However, based on the book *Crop Circles: Signs, Wonders, and Mysteries* I am convinced they were made by aliens; the information on pages 177–179 convinced me of this. Can you help me with an analysis?

—G. Hannye

A: Investigators and researchers at the Committee for Skeptical Inquiry typically can't accept investigation assignments from the public; we don't have the staff to fully respond to all the inquiries we get, much less to launch investigations that could take days, weeks, or months.

However, I was intrigued by this claim and agreed to tackle it in the context of a "Skeptical Inquiree" column if I could. I contacted Mr. Hannye and asked for clarification on a few points, including what specifically he found so compelling about these two particular designs. He replied,

> First of all what interested me was that there were no indications outside of the crop circles of equipment used to make the crop circles. The two crop circles on page 177 indicate that a reply was made to a binary code sent out in 1974. The crop circle was in the same format as the one we sent out. The second was the crop circle on page 178. That one was a message in binary code and was very complex. . . . The book indicates that crop circles are created in hours and usually between sunset and sunrise.

Figure 1: CSI team Kevin Christopher, Benjamin Radford, and Joe Nickell with their crop circle making equipment inside their handiwork. Photo by the author.

I began by researching the cases in my library and online. According to the Crop Circles Research Foundation,

> The Crop Circle which occurred in wheat crop at Chilbolton, reported on August 19, 2001 was perhaps the most important Genuine Crop Circle which has ever been discovered. The Chilbolton Crop Circle clearly demonstrates that the Sagan/Drake message from humanity which was transmitted into space from the Arecibo radiotelescope in 1974 was intercepted by an ET civilization which then sent to us their reply via the Chilbolton Crop Circle in 2001—27 years later! This occurred despite the fact that it should have required 25,000 years for the Arecibo message to reach the star system at which it was aimed! Clearly, someone "out there" intercepted the message and replied, and the means employed to present this message of reply to us can only

> be described as nothing less than miraculous. (Crop Circles Research Foundation 2012)

"The most important genuine crop circle . . . ever discovered" that is "nothing less than miraculous"? Intriguing. Though I have a significant skeptical library, including many books on crop circles, the particular title he referenced was not among them. Mr. Hannye kindly offered to send me a copy of the book, and when I got it I turned to the pages that turned him from skeptic to believer. The text reads,

> The late summer of 2001 gave us two of the most unusual and controversial crop circles yet. In a field beside the Chilbolton Radio Telescope in Hampshire, two crop formations appeared. . . . The first occurred on 14 August. It was a face inscribed into the crop circle using a dot-matrix methodology. . . . The second formation appeared six days later. It was even more bizarre—an oblong area containing a series of patterns and boxes. It was not long before it was recognized as a representation of the binary code first beamed into space from the Arecibo Telescope in Puerto Rico in 1974; however there were a few modifications. The "message" apparently indicated that its creators were silicon-based and smaller than ourselves; they also indicated that they inhabited a binary star system. What are we to make of this and exactly whose is the enigmatic face? (Alexander 2006, 177)

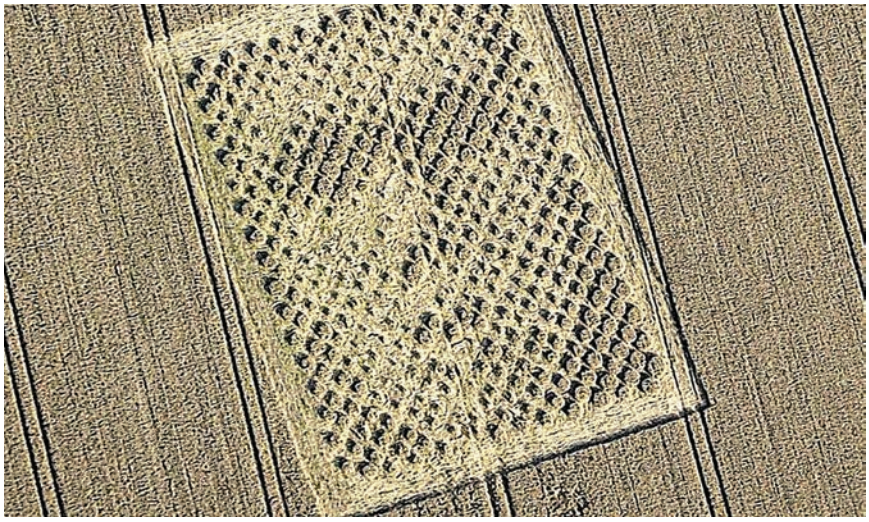
The second crop circle referenced appeared in August 2002 in Hampshire, England. The accompanying text reads,

> This astonishing aliens face and disc arrived in a Hampshire field, next to an array of radio masts in a mirroring—of sorts—of the Chilbolton formations ... The disc was found to contain a form of binary code. It was a short message [allegedly reading, "Beware the bearers of false gifts and their broken promises. Much pain but still time. Believe there is good out there. We oppose deception."] that alluded to the hatred of deception and offered hope for mankind. . . . (Alexander and Alexander 2006, 178)

Crop Circle Theories

Unlike other mysterious phenomena such as psychic powers, ghosts, or Bigfoot, there is no doubt that crop circles are real. The evidence that they exist is clear and overwhelming. The real question is what creates them. Crop circle enthusiasts have come up with many theories about what creates the patterns, ranging from the plausible to the absurd. Many who favor an extraterrestrial explanation claim that aliens physically make the patterns themselves from spaceships. Others suggest that they do it using invisible energy beams from space, saving them the trip down here.

While there are countless theories, the only known and proven cause of crop circles is humans. Most crop circle researchers admit that the vast majority of crop circles are created by hoaxers. But, they claim, there's a remaining tiny percentage that they can't explain. The real problem is that (despite unproven claims by a few researchers that stalks found inside "real" crop circles show unusual characteristics), there is no reliable scientific way to distinguish real crop circles from man-made ones. Using the principle of Occam's Razor and common sense, the default explanation for crop circles is that they are made by humans—unless good evidence is pre-



This crop circle design containing a humanoid face appeared near the Chilbolton Radio Telescope, England, in August 2001.

This crop circle design, containing a stereotypical alien head profile and a coded message, appeared in August 2002 in Hampshire, England.

sented indicating otherwise.

We can look at both internal and external evidence to evaluate these crop circles. Internal information includes the content and meaning of the designs (is there anything that indicates that the information contained in the "messages" is of extraterrestrial origin?), and external information including the physical construction of the crop designs themselves (is there anything that indicates that the designs were created by anything other than humans?).

There is no reason to think that the psychology of extraterrestrials—who of course may not look anything like us (especially if they are silicon-based, as one of the messages claims)—would give any particular value or significance to the human face. In other words, this supposed alien communication bears all the marks of a distinctly human creator.

External Evidence

The external evidence surrounding the Chilbolton and Sparsholt designs is pretty straightforward. Hannye asked about the equipment used to make the designs, and the fact that the circles are made overnight. Of course without identifying the creators and asking them it's impossible to know for certain what they used, but the most common way is with homemade "stalk stompers" (wooden boards attached to rope) to lay the stalks in one direction. The process is actually pretty straightforward and not nearly as complicated as many people assume. In fact I have personally created crop circle designs, including with Joe Nickell and former colleague Kevin Christopher (see Figure 1); the triple-circle crop pattern I designed and helped create was about 120 feet long by forty feet wide, and took only a few hours from start to finish (see Nickell 2004; Christopher 2002).

Both crop designs exhibit many of the classic signs of hoaxing, including having been created under cover of darkness along tram lines and near public roadways (see Radford 2010). Many crop circle designs show amazing beauty and artistry, and this particular pair is no more or less impressive than hundreds of others. There is nothing in the literature suggesting that the physical construction of the Chilbolton and Sparsholt designs could not have been made by humans or that they are otherwise unexplainable in any way. So, let's turn to the internal evidence.

Internal Evidence

Is there anything in the designs that suggests nonhuman creation? In fact, the evidence points directly and unmistakably to human creators. The first thing to note about these two particular crop formations is that they both involve human-based faces. The Chilbolton formation resembles something like a close-up portrait of a human, cropped at the top and bottom and thus not showing hair or a neck (nor, for that matter, does it seem to have ears).

The prominence and primacy of the human face is a distinctly human psychological feature. People see faces in clouds, ink stains, reflections, tree trunks, even in tortillas and other food. In fact the human brain is so hardwired to value faces that the facial pattern (two eyes, a nose, and a mouth) is among the first that infants recognize, and there's even a specific brain disorder called "prosopagnosia" in which people are unable to recognize faces.

There is no reason to think that the psychology of extraterrestrials—who of course may not look anything like us (especially if they are silicon-based, as one of the messages claims)—would give any particular value or significance to the human face. In other words, this supposed alien communication bears all the marks of a distinctly human creator, from its human face to its bordered photograph style, which is aesthetically pleasing to the *human* eye. The "dot matrix" style (actually a simple grid technique) is also less than convincing since artists such as Chuck Close have worked for years in a similar style. The fact that the Sparsholt image looks exactly like the stereotypical large-headed alien seen in countless movies and television shows (in dramatic half-lit profile no less!) is strong evidence for a human pop-culture influence.

Hannye finds it mysterious that "a reply was made to a binary code sent out in 1974. The crop circle was in the same format as the one we sent out." Yet this mystery is easily explained if, as all evidence suggests, the crop message was created by humans. Creating a short binary code message doesn't take a scientist or an extraterrestrial intelligence. If a handful of hoaxers is going to create a crop circle message near a radio telescope that might believably come from aliens, they're very likely to use the same "language" that was famously used to send a message into space years earlier. Of course in theory any extraterrestrials trying to contact us could have used any Earth language or dialect, from English to Esperanto to

Welsh. But using a binary code—and conspicuously in the same form we sent out—was an obvious choice, being both scientific and conforming to crop circle believers' expectations.

Many crop circle believers and skeptics have dismissed these two designs as preposterous. Bill Hamilton, executive director of Skywatch International, Inc., noted that "The fact that the Chilbolton radio telescope is nearby is an indication that someone in that area was knowledgable about the Arecibo signal and could have contributed information to the (human) circle makers to construct this elaborate hoax to entertain us. . . . If this is an elaborate hoax, think of how humans will go to such incredible lengths to fool other humans" (Hamilton 2001).

But by far the most damning internal evidence against this crop circle's authenticity is the pseudo-biblical "alien" message itself: "Beware the bearers of false gifts and their broken promises. . . ." Of all the information that an extraterrestrial intelligence might choose to provide to humanity—ranging from how to contact them to engineering secrets of faster-than-light travel—these aliens chose to impart intentionally cryptic messages about false gifts, broken promises, believing in good, and hope for mankind. These ambiguous, faintly reassuring notes are classic examples of messages from pop culture alien "space brothers" that have allegedly contacted humans for decades (for more on this see Lewis 2000 and Bullard 2010).

In sum, all the information about these crop circles indicates a clear human origin. If aliens did indeed create these crop designs, they seem to have done everything in their power to make their work indistinguishable from human hoaxing. ■

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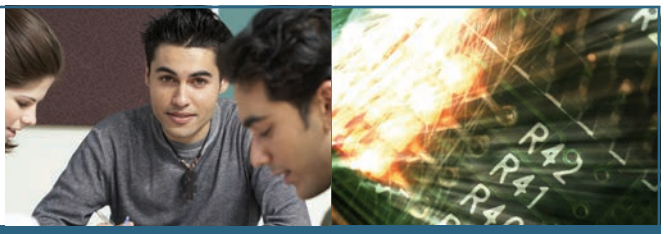

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Discovery's Mountain of Mystery Mongering: The Mass Murdering Yeti

BENJAMIN RADFORD

A much-hyped two-hour Discovery Channel "documentary" aired on June 1, 2014. Titled *Russian Yeti: The Killer Lives*, the program delved into a decades-old pseudo-mystery known as the Dyatlov Pass incident in which nine Russian skiers died under unclear circumstances in the Ural Mountains.

The show was packed with dramatic "found footage" re-creations, dubious derring-do, a pulse-pounding score, and piles of speculation. Though not as blatantly hokey and contrived as the infamous pseudo-documentary Animal Planet program *Mermaids: The Body Found* (which fooled thousands of people, gave credence to the discredited "aquatic ape" theory, and spurred the National Oceanic and Atmospheric Administration to put a note on their website debunking the existence of mermaids), it is nonetheless a textbook example of modern cable TV mystery-mongering and thus merits a closer look.

Here's the premise, from a press release for the show: "On February 2, 1959, nine college students hiked up the icy slopes of the Ural Mountains in the heart of Russia but never made it out alive. Investigators have never been able to give a definitive answer behind who—or what—caused the bizarre crime [*sic*] scene. Fifty-five years later, American explorer Mike Libecki reinvestigates the mystery—known as the Dyatlov Pass incident—but what he uncovers is truly horrifying. . . ."

Focusing on the undisputed facts in this case, we know that at some point on the night of February 1, 1959, after nearly a week of skiing, Igor Dyatlov led the group to cut slits in their tent and leave through the cut for the safety of the wooded area below, most of them wearing their underwear or a few scraps of clothing. After they failed to return, a rescue party was sent, and tracks were followed from the tent to the woods, where all the skiers were found, some of them many months later. According to the autopsies, the cause of death for all of them was hypothermia, or freezing to death. Four of the nine also had internal injuries, and one of them, Ludmila Dubinina, was missing her tongue and had additional injuries to her eyes. The biggest mysteries are why the group abandoned their tent (with their supplies and clothes inside), apparently in a hurry through a cut in the fabric, and what caused their injuries.

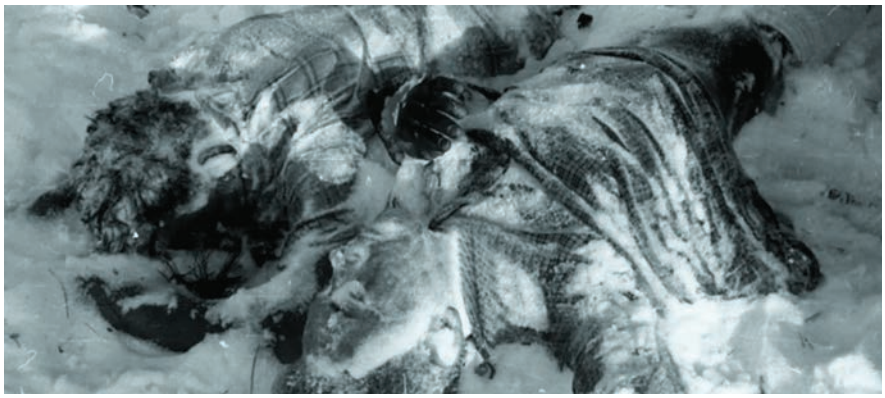
There are many elements and claims to the Dyatlov Pass story, and many theories including UFOs, top secret government conspiracies, and unusual natural phenomena. I won't be addressing those claims (in fact as we will see there's really no need to invoke those anyway) but instead will focus on the plausibility of the newest theory as promoted in the new Discovery Channel show: that a Yeti was responsible for the mass murder of nine Russians in 1959.

The Group's Injuries

Russian Yeti: The Killer Lives begins with the premise that the injuries sustained by the skiers were so grave and extraordinary that they could only have been inflicted by an inhumanly strong creature. The show says that according to the autopsies, the hikers suffered "horrific injuries," including fractured ribs and a fractured skull attributed to a "compelling natural force" (in other words, some sort of blunt force trauma

such as a fall or being crushed).

Unfortunately for the show, photographs of the dead hikers undermine most of the sensational claims. The photographs are crystal clear: the bodies were not "mutilated" at all. They were actually in fairly good shape for a party who had skied into the remote area, froze to death, and were discovered months later after exposure to the elements. Those who had cracked ribs were found at the bottom of a thirteen-foot ravine, and could have sustained the injuries falling into it or at some point after their death during the months before they were found, when buried by an avalanche or crushed by the weight of wet snow.



Photographs of the Dyatlov party taken by rescue teams in 1959. Screen captures from the Discovery Channel program *Russian Yeti: The Killer Lives.*

Libecki makes much of how the bodies were found, for example, of those last to be found, "their bodies crouched and intertwined as of they had been hiding." The interpretation of their body positions "as if they had been hiding" suggests of course that they were hiding from something that would kill them—say, a pissed-off Yeti. However there's a much more likely explanation for why two bodies lost in a frozen wilderness might be found dead "crouched" together and entwined. It's a simple explanation that any fifth-grader can likely see but that apparently escaped world-renowned mountaineer Li-

An image—said to be of a mass-murdering Yeti—claimed to have been taken by a group of Russian skiiers who went missing in 1959. From the Discovery Channel program *Russian Yeti: The Killer Lives*.

becki: they were cold and lay together to conserve heat, as any novice hiker is taught to do. Maybe so, but what about the missing tongue?

The Missing Tongue

Mike Libecki says, "When I found out one of the students was missing a tongue immediately I knew this was not caused by an avalanche. Something ripped out the tongue of this woman." Skeptics will likely immediately recognize the logical fallacy Libecki employs, that the only possible explanation for Ludmila Dubinina's missing tongue is that "something ripped" it out of her mouth. How the woman's tongue was removed would be a question best answered by a medical doctor or a pathologist instead of a mountaineer, but Libecki gamely takes a guess: some powerful animal targeted and removed it. The show spends a lot of time on the mystery of the missing tongue because it is the lynchpin to bringing up the Yeti as an explanation for this mystery.

Here we can bring in the skeptical dictum of Ray Hyman's categorical imperative, which says that before trying to explain something we should make sure there is something to explain; in other words, question your assumptions. For example, if there is a mundane, simple, and likely answer for why the tongue is missing, then we don't need to begin speculating about what may have taken her tongue, whether leprechauns, aliens, or Yeti.

As it happens, a tongue-eating Yeti—even assuming it exists—is by far the least likely explanation for a missing tongue. The "missing parts" aspect of this case is a familiar one to skeptics and has been invoked in countless other "unsolved" mysteries including the chupacabra, cattle mutilations, Satanic animal sacrifices, and aliens. Typically a mystery is mongered by those unfamiliar with—or who intentionally ignore—ordinary predation and decomposition. Lots of animals both big and small scavenge on the soft parts of dead bodies. If it was a tongue-hungry Yeti as Libecki suggests, why would it only have eaten one person's tongue when there were eight more nearby just ready for the ripping? Furthermore, the process of actually ripping out the woman's tongue would leave far greater injuries to Dubinina's mouth, jaw, and head than were found.

The Hikers Meet a Yeti?

We then move on to something about a found military boot cover, proving that the Russian military got to the Dyatlov scene before the rescuers did (opening the door to conspiracy theories, of course).Then, to what (to Libecki) appears to be a cryptic passage written in a newspaper the students brought with them to write on saying, "From now on we know that the snowmen exist." You might think that Libecki would want to consult the original document in order to independently authenticate such an apparently important clue, but he does not.

Libecki says, "The biggest question for me at this point is, why were the students so sure the Yeti exists?" But were the students actually "sure" the Yeti exists? Had Libecki looked at the original document, he would have seen that the students were not reporting an eyewitness sighting of a Yeti during their trip but instead making a joke. As a *Fortean Times* investigation noted, "Perhaps, though, we shouldn't read too much into this; it goes on to say: 'They can be met in the Northern Urals, next to Otorten mountain.' Given the humorous tone of the 'newspaper,' it's quite likely that the students were jokingly referring to themselves rather than recording a genuine sighting of an almasty [or Menk or Yeti]."

Thus the passage actually reads, "From now on we know that the snowmen exist. They can be met in the Northern Urals, next to Otorten mountain." Taken out of context as presented by Libecki it seems mysterious, but in context it's clearly a passing jest, akin to a Bigfoot buff mentioning in passing that he saw the creature at a gas station on the way to a forest to look for the beast. *Russian Yeti: The Killer Lives* and Mike Libecki would have us believe that the nine skiers had an encounter with a Yeti, which

they not only saw and photographed but stalked. And yet none of the skiers mentioned anything else about the Yeti or their shock at having photographed the creature.

At the end of the show, after all the manufactured drama and running around, Mike Libecki admits that he found no real evidence that the Yeti exists, much less that it was responsible for the deaths of nine Russian skiers in 1959. "I did hear something strange," is the best he can muster, which is weak sauce indeed given the previous two hours of breathless claims about photographs of murderous tongue-ripping Yetis.

The one thing known for certain about the Dyatlov Pass incident is that the information about what happened is fragmentary and incomplete. There are many reasons for this, including that there were no eyewitnesses; the bodies were not recovered until months later; the Russian investigation may not have been as thorough as we'd like; it was during the Cold War, and so on. The issue is further clouded by a variety of mystery-mongering writers who have interpreted (and cherry-picked) information to promote their own theories and agendas, including conspiracy theorists, alien and UFO researchers, and others.

There is a simpler explanation for what may have happened to the group that addresses the main questions and doesn't invoke enraged, tongue-hungry Yetis, top secret Russian military conspiracies, or UFOs: they were caught in an avalanche. Svetlund Osadchuk and Kevin O'Flynn, writing in *Fortean Times*, note that several of those most familiar with the case have rejected wild theories and believe that ordinary events killed their friends.

My theory, for what it's worth, is that the group woke up in a panic on that fateful night and cut their way out of the tent either because an avalanche had covered the entrance to their tent or because they were scared that an avalanche was imminent and that was the fastest way for all of them to get out quickly—better to have a potentially reparable slit in a tent than risk being buried alive in it under tons of snow. They were poorly clothed because they had been sleeping, and they ran to the safety of the nearby woods where trees would help slow oncoming snow. In the darkness of night, they got separated into two or three groups; one group made a fire (hence the burned hands) while the others tried to return to the tent to recover their clothing, since the danger had apparently passed. But it was too cold, and they all froze to death before they could locate their tent in the darkness. At some point some of the clothes may have been recovered or swapped from the dead, but at any rate the group of four whose bodies were most severely damaged were caught in an avalanche and buried under thirteen feet of snow (more than enough to account for the "compelling natural force" the medical examiner described); Dubinina's tongue was likely removed by scavengers and ordinary predation.

We will, of course, never know what exactly happened, but it's likely that some variation of this is the real explanation. The cause of the deaths of the skiers is not mysterious or "unknown" as is often suggested; it is in fact clear from the medical examiner's report: hypothermia, or freezing to death. There's really no reason to question the conclusion of the investigators who had firsthand access to all the available evidence at the time. Exactly what caused them to flee their tent can be speculated upon endlessly, but there's no reason to assume that anything unknown or mysterious caused it. In the absence of evidence one wild theory is as good as the next. ■

How Ludmila Dubinina's tongue was removed would be a question best answered by a medical doctor or a pathologist instead of a mountaineer, but Mike Libecki gamely takes a guess: some powerful animal (e.g., a Yeti) targeted and removed it.

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ANN DRUYAN ON THE WONDER OF COSMOS

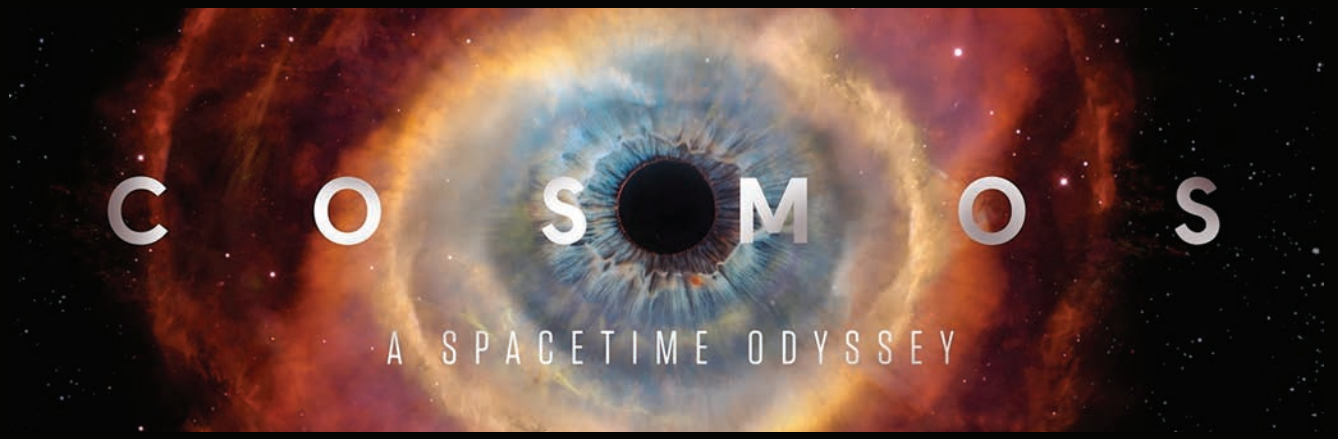
When eight and a half million Americans tuned in to the television premiere of *Cosmos: A Spacetime Odyssey* this spring, the words they heard were indelibly associated with its on-screen host, astrophysicist Neil deGrasse Tyson. But the writer of those words is the show's creator, producer, and writer, Ann Druyan, who also cowrote the original *Cosmos* series, that Emmy-winning, Peabody-winning, broadcast-in-sixty-countries juggernaut that remains the most widely watched PBS series ever. The original show was, of course, Ann's collaboration with her husband, the late, great Carl Sagan. Tyson and Druyan are Fellows of the Committee for Skeptical Inquiry, as was Sagan.

In July the new *Cosmos* led all nonfiction television series in receiving twelve Emmy Award nominations, in categories including Short-Format Nonfiction Program, Documentary or Nonfiction Series, Art Direction, Cinematography, and both Writing and Directing for Nonfiction Programming.

We begin this package about *Cosmos* with Ann Druyan's answers to five questions posed to her by Skeptical Inquirer Editor Kendrick Frazier after the series concluded in June. Then we present a condensed version of an earlier interview about her experience with the first and the new *Cosmos* series by Josh Zepps for our Center for Inquiry's *Point of Inquiry* podcast. (That full interview is online at http://www.pointofinquiry.org/ann_druyan_telling_the_story_of_the_cosmos//.)

Photo: © 2013 FOX BROADCASTING. Patrick Eccelsine/FOX

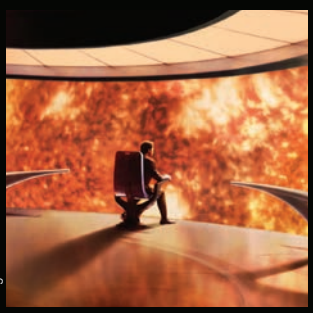
Kendrick Frazier Asks Ann Druyan about the New *Cosmos*

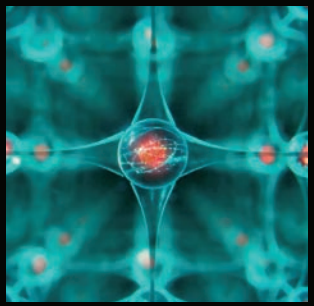


I have been delighted to see that the voices that reject science seem to be a tiny and rather feeble minority on the extreme fringe.

Now that all episodes of *Cosmos* have been aired—to what would seem to be great success—how would *you* describe the public response you have seen so far?

The response has affirmed the premise with which I began: The audience has a longing, one that is terribly under-served in popular culture, a hunger to feel a part of something greater than ourselves without resorting to self-deception. Science reveals that space and time are so much grander than our ancestors ever imagined. The phenomenal success of the show in most of the 181 countries in which it has aired seems to bear that out. The ratings in the majority of other countries have been even better than the stronger-than-expected ratings here. Also, I expected that a show that was uncompromising on evolution by natural selection, climate change, and other issues would ignite a vigorous reaction. I have been delighted to see that the voices that reject science seem to be a tiny and rather feeble minority on the extreme fringe. I don't think any producer/writer/director could hope for a better response to their series. The critics and the audience have fully embraced *Cosmos*.





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As you just noted, you were very forthright in stating that evolution and climate change, for instance, are facts, and then clearly explaining how we know that. What was the thinking that went in how to deal with issues that in the U.S. at least some consider culturally (if not scientifically) controversial?

Seven years ago when I began pitching the series to various networks, they all said "yes," until I told them I required complete creative control and the kind of budget that would make *Cosmos* the transporting voyage it had to be. When they balked at giving me control, and enough money to produce it, I said no. By this time I was working with Steve Soter, Mitchell Cannold, and Neil. I know they must have thought I was nuts and that the chances of making the series on my terms were tiny, but to their credit they hung in. Three years into this quest, Neil introduced me to Seth MacFarlane, the champion of *Cosmos* who had the clout to get it made at Fox, in partnership with National Geographic. Fox gave me the freedom I needed to protect the legacy of our original *Cosmos* and to take on the scientific issues that have been pretty much ignored on primetime commercial broadcast TV. It was worth waiting for. Steve and I sat in my house in upstate New York for eleven grueling months writing the first drafts of the episodes. He left the show two years ago and I continued to write more than twenty drafts of each one. Steve is an astronomer but also an expert on global warming and many, many other things. We had collabo-

rated with Carl on writing the original series. We were able to work those seven-day weeks because we knew we had been given the largest possible platform to make the case for the scientific perspective and possibly to awaken our fellow citizens to realities some of them were trying hard to avoid.

Neil had done science TV shows before; you, Ann, had cowritten the previous *Cosmos* series. If there were differences among the two of you and (or) the visual production people in how best to achieve your common goals, how did they get resolved?

Well, as I noted, I was the decider. But I could hardly make a show about the scientific method while making arguments from authority. There was never any "because I say so." Neil read the early drafts of the scripts and had some comments—one-word changes here and there. We discussed his preferences. Sometimes there was a word like "beautiful," which he doesn't like to use. He caught several scientific errors for which I'm extremely grateful. Most often it was a one-word change here or there. As I recall, the only complete sequence he had an issue with was our treatment of Voyager in episode thirteen. He didn't see why it should be Voyager and not some more recent mission such as Cassini. I debated it with him, and I think I made an argument that was sufficiently strong and he was fine with it. When we were shooting, Neil would see some of the script for the first time in his dressing room while he was being made up. He would question a word or two and we would discuss it. Sometimes he prevailed, sometimes I did. They were fun discussions. Neil is an outstandingly cool person, gracious, brilliant, knowledgeable, fair, and kind. Minutes later, he would be on set, reading teleprompter or cue card, and he is so talented, you would swear that the words were coming out of his own head.

Having gone through this whole process making *Cosmos*, what advice would you have for other scientists or science communicators who might consider taking on anything at all similar?

My advice would be: Stick to your principles. Give it everything you have. Do not get discouraged. Having been in this business for thirty-five years I can say that it's always a rollercoaster ride that takes a good deal longer than you would ever expect. It took us seventeen years to bring *Contact* to the screen after Carl and I wrote the lengthy

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treatment, and it took seven years for *Cosmos: A Spacetime Odyssey*. I was deemed ineducable by various science professors long ago. When we were wandering in the wilderness of those early network prospects for this *Cosmos*, one of them told me that Steve and I were too old to write it and that they had new young writers ready to

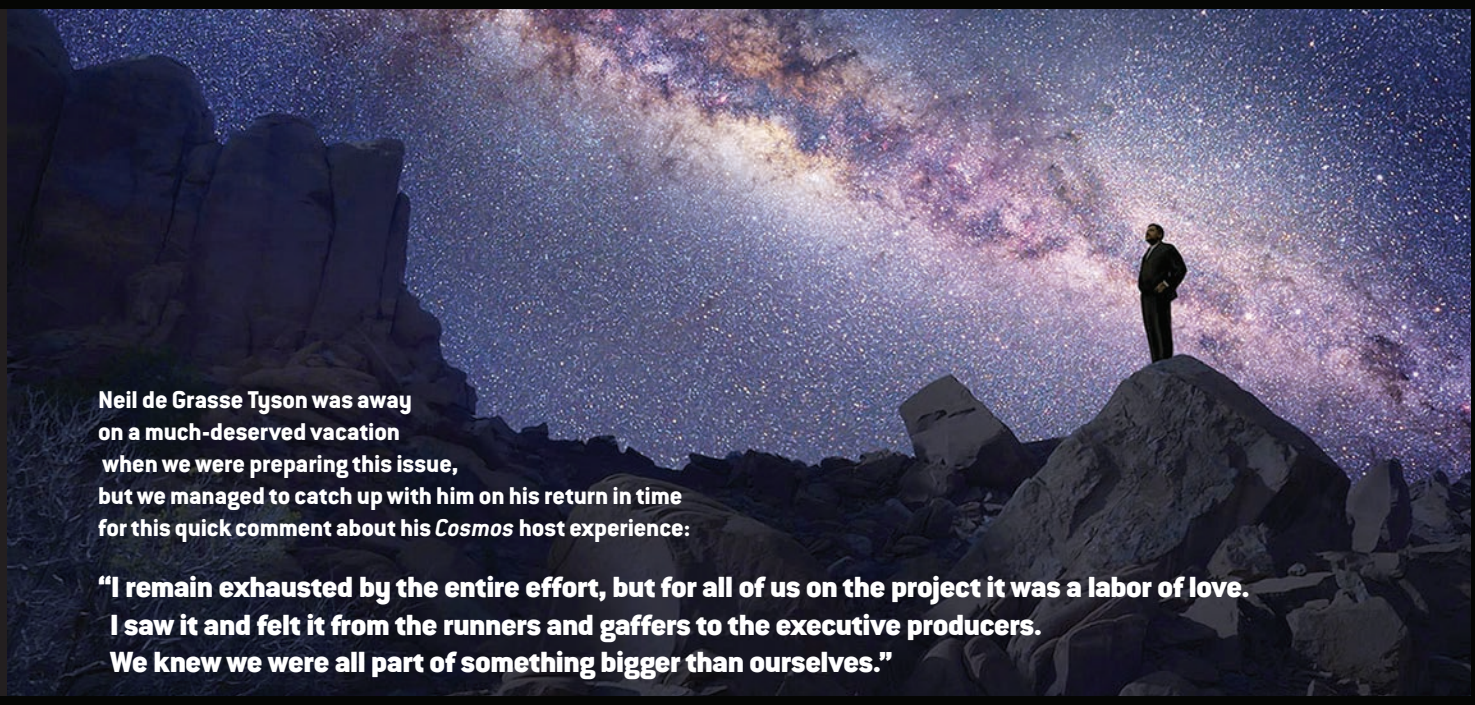
My advice would be: Stick to your principles. Give it everything you have. Do not get discouraged.

I re-acquired the original master tape of Carl's voice, one that hasn't been heard in almost twenty years, for episode thirteen.

take over. I knew that we knew what *Cosmos* was and we just walked away. My advice is: If you have conviction, then don't be turned around. Would I do it again? I hope everything I do for the rest of my life will reflect the values at the heart of *Cosmos*.

Your opening episode ended with a generous and moving personal tribute by Neil to Carl Sagan. The end of your final episode included an equally moving recorded reading by Carl of a poetic passage from his *A Pale Blue Dot*. Was that an easy decision, or did it take a lot of thought and discussion?

Before Steve and I started writing, when I happened upon the page in Carl's office daybook from 1975 with Neil's name written in it, the structure and language of episode one and indeed the rough outline of the series seemed to form whole in my brain. I knew then how I would write it. I wanted Carl to be a continuing presence in the series, but it had to be organic and unforced. I receive more requests for the rights to *Pale Blue Dot* than any other single thing Carl wrote. Because it combines the scientific view with its ethical implications so successfully, it had to be part of the series' conclusion. Brannon Braga and I and the other producers grappled with what we would be seeing while Carl spoke. It wasn't until very close to the end of production that I realized I wanted to see the Earth from Voyager's point of view, steadily diminishing until it became that dot. Brannon said "that's going to be a very long shot, Annie." But together, we and Rainer Gombos, our brilliant VFX supervisor, were finally able to get what we wanted. Incidentally, I re-acquired the original master tape of Carl's voice, one that hasn't been heard in almost twenty years, for episode thirteen. One of the many gratifications of making the series was how many people commented online that the *Pale Blue Dot* sequence was their favorite one in the new series. ■



Neil de Grasse Tyson was away on a much-deserved vacation when we were preparing this issue, but we managed to catch up with him on his return in time for this quick comment about his *Cosmos* host experience:

"I remain exhausted by the entire effort, but for all of us on the project it was a labor of love. I saw it and felt it from the runners and gaffers to the executive producers. We knew we were all part of something bigger than ourselves."

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Josh Zepps with **Ann Druyan**: *Cosmos*, Carl Sagan, and Culture

We think of you and Carl as having been this unstoppable scientific duo, but I was surprised to find out that you weren't a scientist. You never studied science. Where did your science passion come from? Was it always there or did it evolve?

No, it wasn't originally. I had that misfortune which so many of us have. I didn't really have great science teachers who were willing to work with me, and I think if you asked them, even when I was in college, about my potential as a scientist, they would have said that I was probably ineducable. Not about the history of science, which I was passionate about, fascinated by the history of ideas, but to do even entry-level calculations of physics, for instance. I just couldn't wrap my head around it, and I think it began with a terrible math trauma, which is immortalized in Carl's novel, *Contact*, and it was my first understanding of junior high school. After the trauma of my junior high school math class, I went down another road.

I wish that there'd been a metascience class or a philosophy of science class before you get to the college level, to inspire people with science in a way that doesn't require petri dishes and memorizing the Periodic Table.

Precisely, I couldn't agree more. It's an irony that my career has been a kind of bridge to all the people like myself who had a passion to understand the way the universe is put together, but really needed some kind of aperture into the subject. I was much more attracted to English literature and to film and in my early twenties I became fascinated by materialism, and from a political perspective was really excited to understand who were the first people to demystify human experience and not to resort to God as an explanation. That brought me to the pre-Socratic philosophers, and I fell in love with them.

In fact, I think I imbued Carl with a much greater feeling of appreciation for them, and that was before I met Carl. Once we were together we were able to explore. . . . I mean just imagine having any question of the day or night and being able to turn to the person next to you, and it's Carl Sagan.

It's inspiring to think that things are actually explicable, right?

It's not only inspiring, it's empowering. Once you start actually looking for the root cause of things. . . . I mean, as I write in the series, the answer "The planets move the way they do because God wants it that way, because God did it" is the closing of a door. There's no follow-up question to that, and that's the opposite of science.

When you worked with Carl, did you feel like you were engaged in something. . . . I don't want to use the word *spiritual* . . . but, spiritual?

I've felt that every day of my adult life, and with every

KEVORK DJANSEZIAN/REUTERS/Newscom

single thing I've ever worked on. Of course, you know, the romance of life in the universe is a constant back-beat to everything that I've ever worked on. It's that feeling of celebrating, that joy that you can feel when you not only allow yourself to be as tiny and as non-central to the workings of the universe, and just allow yourself to appreciate the little we know about where and when we are.

There's nothing more exciting than that, for me. Especially as it has that extra layer of

The romance of life in the universe is a constant back-beat to everything that I've ever worked on.

satisfaction within, that this is the fruit of the most rigorous testing that we are yet capable of. This is what we've distilled from existence, the idea that we're part of a 13.8 billion year story. I mean, you know, it's just . . . it's a bigger story than anyone dreamed.

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Can you just inform me, on a behind-the-scenes level, how the cosmic calendar used in both *Cosmos* series came about?

I should say that Carl and I created the original series with Steven Soter, who was also my collaborator on the first several years of the new *Cosmos* series, and he was a very important contributor to both. I remember working with Steve and Carl and imagining what this great football field of time would be like.
I think one of Carl's many, many strengths was that he recognized that we are story-driven, that if you could create a narrative that everyone, young and old, could grasp and experience, that the information suddenly becomes a much more natural thing, and so Carl, who I think may have been inspired by "Powers of Ten" earlier and other attempts at figuring out a way to limn the vastness of space, wanted in his own mind to do the same thing for time. It became the most natural thing to take this giant football field and parcel out the months, each month in our calendar, because the universe has become much younger in the intervening thirty-five years and lost a couple of billion years. Each month represents a little more than a billion years, and, of course, each day around 40 million years.

Then, of course, the payoff of the analogy that all of human history is in a fraction of a second at one second to midnight on December 31.

Exactly, and just the idea of how young we are. It's one thing to realize that the Earth is not the center of the universe, but the next level is to understand that we are so newly arrived; we are so young, and of course we don't know very much, and there's a humility of science, which is saying that our ignorance exceeds our understanding on every level. But here we are finding our way, testing the things we think are right, and being willing to find out that they're wrong. That's mental health, you know. Really, it works as a good definition of either.

Creatively, when the three of you were coming together... and I'm glad that you mentioned Steven Soter because we don't want to leave him out . . . how do you even begin to get your heads around it all? We want to express the majesty of all this stuff in a way that tells stories and that relates to people, but where do you start? What do you leave out? How do you decide what to include and how?

Well, there's a winnowing process of years of discussion, not just among the three of us . . . although I cherish the memories of those fantastic, into the wee, wee hours . . . obviously, as far-ranging as *Cosmos* itself has been. Also, later on, when we joined together with Adrian Malone, who was our original executive producer, and the extraordinary team of people he assembled to actually implement our ideas for how we wanted to tell the story, it took flight. It was a multi-year process, and sometimes . . . you know, it's more a case of you have more stories to tell than we had the time to tell them in. Sometimes certain components, certain sequences, get expanded because of the visual possibilities and because of the information, and so it was just as you imagine.
I had certain stories I always wanted to tell; for me the Library of Alexandria was something that I wrote about in my first novel. I was really enchanted by this idea of a government that was so interested in knowledge. Carl, of course, had a lifetime of thinking about the subject of life on

other worlds. He was a pioneer in that field, and he had things that he wanted to do, which we together turned into sequences, and Steve was interested in a great many things, but he had a special interest in protecting the planet.
There wasn't a single episode that we didn't all three of us have our hands on . . . each script had so many iterations, so many drafts, and we were constantly just cutting and eliminating and adding. It was just a feast of ideas, to be with the two of them and to be able to just spend hours thinking, bringing up fascinating stories about the ancient world, about the future.

Did you have confidence that the audience would get it? Did you have any sense that it would become the iconic show that it has become?

I think everyone knew that we were engaged in something extraordinary from the very beginning. Most of the time we don't ever get to do something that's shooting for the stars and trying to make history. The joy of actually doing that is the greatest feeling. I hear this all the time; people are so inspired by Carl Sagan's life and work, and by the legacy of the original series, *Contact*, and a bunch of things that we've done together. Really, I'm overwhelmed.

I'd love to get your thoughts on the state of American culture and scientific literacy and the religious right. I mean, when you think about the audience that was receiving the original *Cosmos* and the audience today, do you think America has become more or less reasonable?

Well, I think it's a pendulum, and it has a tendency to oscillate, swing back and forth. Back when we were doing the first *Cosmos*, the Apollo missions and the glory of that still had a tail; it was declining, but you could feel it. There was an excitement about the future and space that I think we've largely lost. I think we've gotten a little bit depressed and dystopic, hung up on a kind of apocalyptic view of the future, but *Cosmos* just comes at a good moment, because the pendulum swings both ways. I felt like it was swinging back our way; about a year or two ago I really began to feel it, for a number of reasons and I've been really excited that we have made several very uncompromising statements on the show on Fox and around the world, largest roll-out of its television series globally in history, and we talked very forthrightly about creationism, about intelligent design, about the much smaller universe that you get from the fundamentalist perspective, and how much darker and smaller that is. I've been really excited to see that the reaction has been negligible, you know?
The acceptance, the embrace of the show has been overwhelming. So I just feel like... we just happen to be on a good part of the wave.

Good. Your optimism delights me.

Don't you feel the same way?

Not really, I have to say, to be honest. Perhaps I spend too much time debating creationists and engaging in that world, and perhaps American culture is sufficiently different from the culture I grew up in that it still strikes me as stark. I hope you're right. I think you're right that the pendulum has to swing and that sometime soon it has to swing back. This can't be an endless descent, but if I'd been alive a half century ago, then I think I would have thought that in 2014 we'd be over this by now.

Well, from my perspective, at my age, I grew up in a very racist, homophobic, sexist world. Even though it's largely thought of as a time of great enlightenment and opening up, you know. . . . The things that people casually did or took for granted, which we would now find egregious. . . .

I interviewed Joel Osteen, one of the most popular pastors in the world, not long ago, and I read to him a paragraph from Carl Sagan's *Pale Blue Dot*, I showed him that iconic photograph from Voyager of Earth suspended there in a sunbeam, and asked him whether or not he thought that it made sense that all of this was just created as a backdrop for God to figure out whether or not we were going to be good or evil or to try to pray to him for—

What did he say?

He dodged the question, as he dodged most of them, but he said something about ours is not to question the purpose of his majesty. All of this. It's an extraordinary universe and we can only humble ourselves before him and wonder what the point of it all is.

Well, I hope that we have some kind of influence so that the next time they have that thought, they may question it . . . how logical it is. I have no metric for how many minds we've changed. I like to think that this will have some effect, and that the availability of *Cosmos* on so many platforms and the ideas, that we are really trying to articulate the case for the scientific perspective, and its power. That it will have some influence. I hope so.

Trust me. It's having a big influence.

How do you know that?

It's such an exciting, sparkling thing in the zeitgeist, at the moment, *Cosmos*. It's something that people are talking about. It's something that people are aware of and excited by. I can't recall another nonfiction television event that has captivated at least the conversation quite so much in my lifetime.

You've made my day, Josh.

Thank you so much for being on *Point of Inquiry*, Ann.

Oh, it was my pleasure, Josh, and best regards to everyone at the Center for Inquiry. ■

From SI's Archive:

"Ann Druyan Talks About Science, Religion, Wonder, Awe . . . and Carl Sagan." November/December 2003

Runaway Hysteria

The Toyota Panic, with the Federal Government's Seal of Approval

A media blitz aided and sanctioned by the U.S. government portrayed Toyotas as death-mobiles, causing worldwide panic. In fact, there was no increase in either injuries or deaths, merely a form of "media-genic" mass hysteria.

MICHAEL FUMENTO

The U.S. Department of Justice (DOJ) slapped Toyota Motor Corporation with the biggest fine in DOJ history in March 2014 (Robillard 2014), solidifying the idea that the "runaway Toyota" panic of 2009–2010 was quite real even though it seemed torn from the pages of a Stephen King novel. Toyotas were smashing into walls, doctors' offices, nail salons—even a Toyota dealership.

Touché! There was even talk of "demons" and "ghosts."

In fact, there was nothing wrong with the company's throttles or floor mats, no "ghost in the engine," no gremlin under the hood. Before the panic, consumers rated Toyotas as among the safest cars built. Yet suddenly these very same cars became death traps, doing that which was not only improbable but literally impossible in some cases, such as killing more passengers than they could possibly hold—and doing so before they were even built.

It was all mass hysteria. There's no evidence that during that time a single person was killed or injured by a defective Toyota. Oh, really now, all of it? Yes, all of it.

Toyota's sudden surge in sudden unintended acceleration (SUA) incidents, from nearly none over the course of a decade to 6,200 (CBS News 2010) in just months could not have been caused by the cars or negligent drivers, as some naysayers claimed. Neither the cars nor their drivers changed; all that changed was public perception.

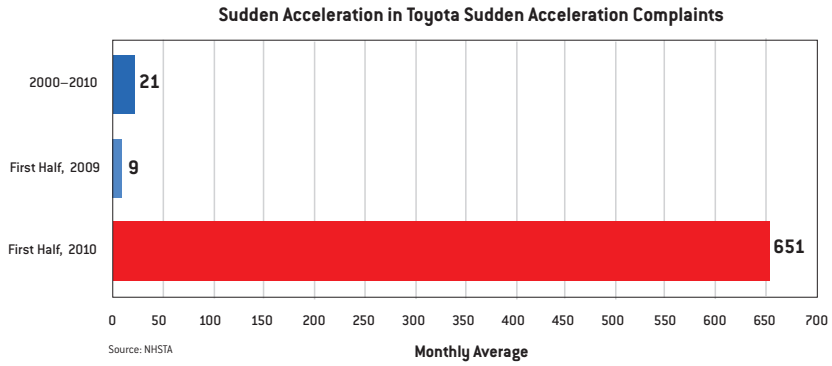
Consider whether either mechanical failure or bad drivers can explain any of the following:

- During the first half of 2010, the National Highway Transportation and Safety Administration (NHTSA) of the Department of Transportation (DOT) logged almost twice as many entries regarding Toyota speed control as during the previous decade. It was more than fifty times as many as during the first half of 2009. Yet both the fleet and the drivers were essentially the same.[1]
- The 2010 Prius, in its first seven months up to February 1 of 2010, averaged just eleven NHTSA entries per month—a total of seventy-eight. Two days later, 257 poured in (Loveday 2009).
- The next day, February 4, Toyota was slammed with as many SUA entries as in all of 2008. In the first ten weeks of 2010 it received more than in the previous ten years. Reported problems subsequently spread from Toyota throttles to all parts of the vehicles—almost a six-fold increase from the first half of 2009 to the first half of 2010.

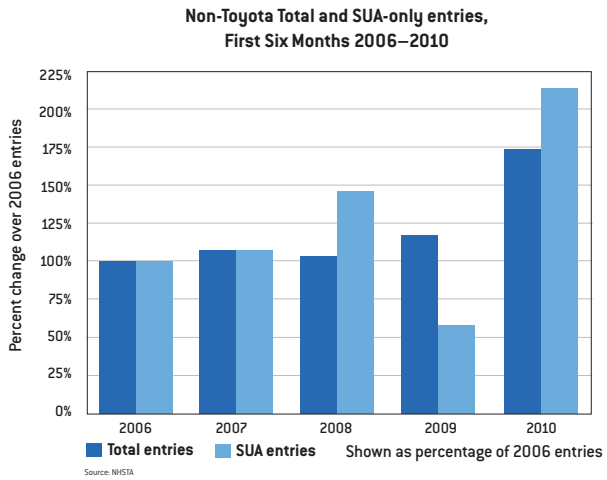
Then, the inevitable happened. The contagion jumped to other car makers.

Their overall NHTSA entries in the first six months of 2010 were half again as high as the average for the first half of the preceding four years. Their speed control entries more than doubled from 2009. This undoubtedly helps account for why non-Toyotas comprised about 13 million of the total 20 million recalled vehicles in 2010 (Cars Direct 2012).

These data are readily accessible on the Internet. Yet somehow every newspaper, magazine, newscaster, and pundit using the expression "Why Toyota lost



In one year, Toyota's SUA complaints went from nearly none to flying off the charts. The contagion soon spread to other car makers.



Single-Spark U.S. Mass Hysterias of Our Generation

- On Halloween night 1974, an Illinois man who had taken out life insurance on his eight-year-old son killed him by putting cyanide into a Pixy Stix, a straw of dextrose. Suddenly, razor blades were appearing in apples magically without tell-tale slits, requiring X-rays. Trick-or-treating was forever changed in the U.S.
- The brutal kidnapping and decapitation of six-year-old Adam Walsh in 1981 set off the missing children scare. His now-famous father, John (of *America's Most Wanted*), was repeatedly quoted saying more than 1.5 million children are abducted annually, and presumably 50,000 were kidnapped by strangers. The numbers stuck. The actual number is about one hundred.
- A severely alcoholic mother with paranoid schizophrenia accused a staffer at McMartin Preschool in California in 1983 of sexually molesting her two-year-old son. The flurry of accusations that followed included the staff beheading a baby, one employee flying through the air, and children forced to use pickaxes and shovels to dig up coffins, whereupon their teachers mutilated the corpses. Thence the hysteria of Satan worship at daycare centers went nationwide. One child care worker accused of killing a giraffe and an elephant in front of children spent thirty months behind bars. Some of the "Satanists" are still in jail.
- An epidemic of pit bull attacks began in the mid-1980s after a nationally televised video showed one of the dogs attacking and maiming a female animal control officer.
- The Audi sudden-acceleration hysteria, a direct precursor to the Toyota tempest, began in 1986 when a woman driving a 5000 series ran over and killed her young son. Initially she told police that her foot had slipped off the brake onto the accelerator, but by the time she appeared on *60 Minutes* it was clearly a sudden unintended acceleration problem. Audi acceleration complaints swamped the National Highway Traffic and Safety Administration, which later found nothing wrong with the car.
- The short-lived 1993 epidemic of cell phone-induced brain tumors began with a *Larry King Live* guest making the physiologically impossible claim that a cell phone gave his wife a tumor just three months after she began using it. (In fact, latency time from brain irradiation is measured not in months but in years or decades.)

its way" missed this phenomenon.

"It was all 'mass sociogenic hysteria,'" says Robert Bartholomew, a New Zealand sociologist and recently coauthor with Skeptical Inquirer deputy editor Benjamin Radford of *The Martians Have Landed: A History of Media-Driven Panics and Hoaxes* (Bartholomew and Radford 2011). "A mass delusion, called a 'moral panic,'" he said. These tend to occur when a society is undergoing wrenching changes, such as the U.S. has been for the last several years with the end of its world trade dominance, stubbornly high unemployment rate, and wage stagnation or decreases among the vast majority of the population in what's progressively being called "The End of the American Dream."

Toyota's hard-won reputation for quality and safety came to a crashing halt during approximately one horrific minute.

Moral panics led to the medieval witch burnings as well as the missing children and day care center scares of our generation (see sidebar). In the former, the perceived number of stranger-kidnapped children suddenly jumped from 100 a year to 50,000. Then, as with the Toyota incidents, nobody stopped to think that such things simply cannot happen.

The Stampede Begins

Just as startling is that this massive farce, sustained for well over a year, began with a single spark fanned into a wildfire by just two ambitious reporters—only later aided by trial lawyers, the government, and a mainstream media so tightly bound by pack journalism (Kraus 2008) that they've come to resemble McDonald's franchises, with the identical product guaranteed at every outlet.

Toyota's hard-won reputation for quality and safety came to a crashing halt during approximately one horrific minute (Schmidt and Su 2009) on the evening of August 28, 2009. Mark Saylor, a nineteen-year California Highway Patrol (CHP) veteran, was driving a 2009 Lexus ES 350 on a San Diego County freeway with three family members when the car suddenly roared past 100 mph. Saylor's brother-in-law placed a chilling call to 911 (Collins 2009), forty-seven seconds long, that vast numbers would later listen to on the web. His last words: "Hold on!" and then "Pray!"

The Lexus clipped an SUV, went airborne, and crashed in a ball of fire. All passengers in the vehicle died. Both NHTSA (Collins 2009) and the local sheriff's department (Schmidt and Su 2009) would find the cause to be that the car, a loaner from the repair shop, had the floor mat of a different vehicle, an SUV. It was extra thick and couldn't be fastened, which allowed it to slide under the accelerator and jam the throttle open. Yes, Saylor could have shifted into neutral (Consumer Reports, n.d.).Yes, brakes always override throttle, including in tests on a car similar to Saylor's (Fumento 2010a). But CHP officers can panic just like anyone else. Saylor did.

In fairness, Toyota deserves much blame for its PR strategy—or lack thereof. That includes President Akio Toyoda's public apology (Sanchanta 2010), which may have been all the more humiliating when he discovered that, while such apologies in Japan are a common business practice (Rowe 2010), meaning one regrets that something occurred, in the U.S. they're often taken to mean "I'm guilty as hell."

But Toyota's first mistake may have been its first recall, of 3.8 million vehicles, announced in late September of 2009 (Kelts 2010). This was to fix potentially sliding floor mats. Coming just after the Saylor accident—and before investigations showed it was the wrong floor mat—it seemed to support accusations that Toyota had long known about "the problem." Shares in the company lost a third of their value, whereupon shareholders then sued the company (Anderson 2010) over the massive drop. Despite evidence to the contrary, the media never quit accusing Toyota of having faulty floor mats or accelerators, including in coverage of the Department of Justice announcement.

Automotive testing director Dan Edmunds at the chief automotive authority Edmunds.com says there did seem to be an extraordinary problem with Lexus mats—judging by NHTSA entries. But he notes that with very rare exception, floor mat problems are caused by drivers stacking one atop the other, preventing the upper one from being attached. Further, floor mat fasteners generally break after time. You simply replace the mats. Regarding the throttles, independent investigations (National Highway Traffic and Safety Administration 2011) by both NHTSA and NASA found nothing wrong with the electronics—as had been almost universally claimed.

Consider that when the floor mat recall was announced, only 350 Lexus speed-control entries since 2000 were in NHTSA's files, floor-mat related or otherwise, out of almost 2.8 million sold. Why did nobody notice these problems until they were *told* to notice them?

Toyota got hammered yet again the first week of February when then-Transportation Secretary Ray LaHood during congressional testimony (Fox News 2010) made the remarkable assertion that owners of Toyotas should "stop driving" them and the DOT an-

nounced (Terlep and Mitchell 2010) it was widening its Toyota SUA probe to consider the possibility of electromagnetic interference with the electronic throttle systems (Mauser and Thurner 1999). That's what set off that huge spike in complaints on February 4, as noted above.

The Dynamic Duo of Misinformation

Then *Los Angeles Times* reporters Ken Bensinger and Ralph Vartabedian struck. "Toyota's Runaway-Car Worries May Not Stop at Floor Mats" (Vartabedian and Bensinger 2009a) was their first piece, on October 18, 2009. This was quickly followed by "Runaway Toyota Cases Ignored" (Vartabedian and Bensinger 2009b), and then the biggie: "Data Point to Toyota's Throttles, not Floor Mats" (Vartabedian and Bensinger 2009c).

Toyota had introduced electronic throttles (Deaton n.d.) gradually, from 1998 to 2006. These replaced a steel cable with sensors and microprocessors to increase mileage and reduce emissions. The *Times* reporters never explained why this gradual transition to electronic throttles didn't cause a gradual increase in complaints, rather than an abrupt leap in late 2009. One model the reporters singled out as illustrative was the Tacoma truck (*U.S. News & World Report* 2013), which first got electronic throttles in 2005. Yet when the story ran, the 2005 Tacoma had only twenty-three speed control entries out of about 169,000 sold (*Auto Channel News* 2006). It was only after the Bensinger and Vartabedian (B&V) article ran that Tacoma entries flooded NHTSA.

Thus fear begat fear, and fear begat recalls that Toyota claimed were precautionary but the *Los Angeles Times* and others painted in quite a different light. Thus after the accelerator recall in late 2009, the title of the B&V article was: "Toyota to Fix 'Very Dangerous' Gas Pedal Defects" (Bensinger and Vartabedian 2009a). Said whom? "Federal regulators," according to the writers. And which "federal regulators" were quoted either by name or even "speaking off record" or "wishing to remain anonymous"? None.

Reporters often disguise "straight news" by carefully pre-selecting their sources. B&V relied heavily on professional critics of the auto industry. One was Clarence Ditlow of the Naderite Center for Auto Safety (www.autosafety.org), which has done more than anyone to popularize the concept of SUA as a mass phenomenon rather than an extremely rare and isolated event. The other was Sean Kane of Safety Research & Strategies, Inc. (http://www.safetyresearch.net/about-us/), who regularly consults (Dolan 2010) for trial lawyers suing car companies—something B&V never mentioned.

The two men continued to shape the story and lead the media pack, with over forty articles on the subject written together, and additional ones written separately or with other coauthors. The newspaper as a whole published over 100 articles or columns (http://projects.latimes.com/toyota/) on alleged Toyota SUA, with such titles as "Denial Is a Familiar Road for Toyota" (Hiltzik 2010). The Dynamic Duo was a finalist for both the Pulitzer Prize and the Michael Kelly Award (Dupuy 2010), the latter for challenging "Toyota's explanation that the acceleration problems were caused by a glitch involving floor mats." Ironically some years earlier Michael Kelly (Kelly 1996) and I had exposed another U.S. mass hysteria (Fumento 1996) at exactly the same time, that of the alleged "epidemic of southern church arsons." One suspects he would not have approved.

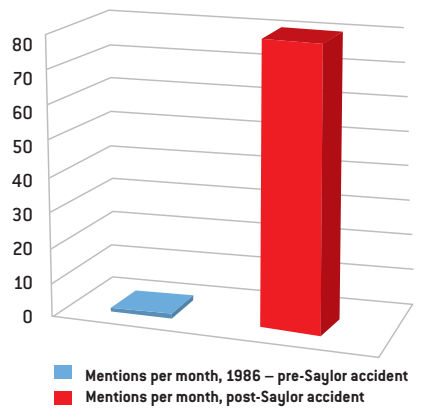
Two weeks later lawyers filed the first Toyota SUA class action suit (*Seong Bae Choi and Chris Chan Park et al. v Toyota Motor Corporation, Toyota Sales U.S.A., Inc. and Does 1-10*). At that time, only eighteen alleged Toyota-associated deaths had been reported in the previous decade. In the next seven months, seventy-five more poured in. The media merrily swapped NHTSA's careful "associated with" for headlines clearly saying "They did it," including: "led to" (Bensinger and Vartabedian 2009a), "have killed," (Bennett 2010), and "has killed" (CBS News 2010). Yet as I reported (Fumento 2010b) in *Forbes* ("93 and Counting: In their Toyota Coverage Reporters Aren't Letting Facts Get in the Way of a Good Story"), a close look at the NHTSA entries and some research on my part showed that quite possibly only the Saylor deaths qualified.

Impact of the Media Cascade

The Toyota hysteria is what University of Toronto social medical historian Edward Shorter calls a "'mediagenic' illness," which is spread by the press. The combined search terms "Toyota,"

From one spark, a raging fire.

Nexis Mentions of Toyota SUA Before and After Saylor Accident of 8/28/2009



"acceleration," and either "unintended" or "unintentional," using the Nexis periodical database shows about ninety mentions from 1986 up to the Lexus accident. But after the Saylor crash up until mid-2010, there were over 800. That's from about one per month to eighty.

As the earlier figures and graphs show, coincidentally there was an incredible spike in NHTSA entries. Yet B&V ridiculed (Vartabedian and Bensinger 2009b) Toyota for asserting this, specifically regarding the Tacoma SUV. Their source? A quote from a disgruntled Tacoma owner. That's it. In fact, both Google and Nexis show a dramatic increase in media and Internet exposure regarding the vehicle beginning in 2007. Moreover, countless NHTSA entries about Toyota SUA specifically mention (National Highway Traffic and Safety Administration N.d) media reports.

Everyone treated the NHTSA entries as gospel, yet anybody can file a complaint saying anything about any car. And they do. Indeed, I found that at least three of the allegedly fatal accidents never occurred.

Everyone treated the NHTSA entries as gospel, yet anybody can file a complaint saying anything about any car. And they do. Indeed, I found that at least three of the allegedly fatal accidents never occurred. But ever at the forefront, the *Los Angeles Times* came up with *105* (http://projects.latimes.com/Toyota/) associated deaths. Yet NHTSA never made an active effort to explain that their files were intended only to spot possible trends and were the farthest thing from a true database.

I discovered that (Fumento 2010b) one Massachusetts woman, after her son killed a fellow passenger while driving drunk in a Toyota Scion, found a number of fatal Scion accidents online and posted them all in the NHTSA files under the "speed control" category. Presumably she was giving him cover. And yes, she entered his accident as related to speed control as well, as she admitted to me by phone. (He was later convicted of motor vehicle homicide while DUI [Linton 2011].) There's a 2005 Corolla that suddenly accelerated (National Highway Traffic and Safety Administration 2010) and killed ten people—way back in 1973. April Fool's Day, to be exact. (NHTSA did exclude those ten from its death count.)

A non-Toyota killed ninety-five people. Twice. An entry from "Damnable Liar" concerns a car that due to a child-seat problem suddenly accelerated to 999 mph and flew to the moon (that was my own entry!).

Hoaxes aside, assuredly most of the runaway Toyota entries are from false memories instigated by the media mayhem. False memories are universal, even without prompting or much passage of time. Post-crime eyewitness accounts routinely contradict each other. A poll taken right after JFK's assassination showed (Miller and Frankovic 2007) that somehow he had picked up an additional 10 million votes. Yet some Toyota alleged SUA incidents were entered three decades after the alleged incident.

Nor do hysterias require memory lapses. In 1909, thousands of New Englanders saw a huge airplane that had been widely discussed in the media. *The New York Times* (Whalen and Bartholomew 2002) gave a very detailed description of the aircraft, its altitude, and movements. But there was no plane; it was all a hoax. In a reccurring mass hysteria called koro (Bartholomew 1994; Tucker 2012), men look between their legs and no longer see a penis. Yet while 24 million Toyota owners were repeatedly told their cars were prone to suddenly run amok, merely a few thousand reported such problems. Americans actually reacted more calmly than they might otherwise, given all the stimulus to panic.

Stephen King Triumphs

If four people died in a Ford, it was a local issue. Yet non-injury Toyota accidents became world news. Law firms amplified the presence of scare stories by reposting them on "public information" websites (such as http://sudden-acceleration.com/) and reprinting all articles about serious Toyota accidents, regardless of whether anyone even tried to implicate sudden acceleration. Four years after they were built, some of those websites are still active.

Two Prius incidents in March showed the inability or unwillingness of a frenzied media to notice the obvious.

- When James Sikes's 2008 Prius allegedly raced out of control on a southern California freeway, he called 911 on his hand-held cell phone and talked to a dispatcher for nearly half an hour. In my Forbes.com expose (Fumento 2010c), I noted that he told many reporters he "was afraid to" (CNN 2010) simply shift into neutral, insisting he needed to hold "onto the steering wheel with both hands." Nobody asked about that cell phone.
- Three days later, a Norwegian driver, who also placed an emergency call, said his Prius suddenly accelerated

to over 100 mph even as his brakes failed, forcing him to stop it by ramming into a guard rail. Norway's traffic safety agency considered a temporary driving ban (Sandelson 2010a) on the Prius. Yet photos[2] accompanying news stories showed mere scratch marks on the fender.

At least in Norway the driver was later indicted (Sandelson 2010b) for filing a false report. Sikes didn't even get a wrist slap, even as Rhonda Smith became that peculiar American creature known as the victim-hero. Her scolding during congressional testimony (YouTube 2010) in February 2009 was a shot heard 'round the world. "Shame on you Toyota for being so greedy! And shame on you NHTSA for not doing your job!"

Dabbing at her eyes, she insisted that in addition to her nearly new Lexus ES350 suddenly accelerating her brakes also failed. In fact, absolutely every system that might have helped her to stop also failed, though the odds against this are astronomical. Having failed, it would literally have taken a miracle to restore them. Which might explain why she invoked a miracle for saving her. "At six miles," she said, "God intervened." It brings new meaning to those bumper stickers, "God is my co-pilot."

Her real complaint was that NHTSA *did* do its job. Its report, available online with photos, showed she had two mats stacked atop one another. The top one couldn't be clipped down and presumably slid under the throttle. The congressional committee acknowledged (YouTube 2010) they'd received the report, but nobody challenged Smith's fanciful tale. Instead, committee members took turns roasting Toyota's representative at the hearing over a spit, basting as necessary, for three straight hours. Media credulity was represented by the Forbes.com reporter who wrote that "the only witnesses [that day] with much credibility were [husband] Eddie and Rhonda Smith" (Muller 2010).

But NHTSA bought Rhonda Smith's car (Niedermeyer 2010) (which was subsequently sold to someone who put 27,000 miles on it without incident) in order to test it, and in 2011 announced that it and NASA ". . . did extensive testing of that Lexus, including electromagnetic interference testing, full throttle testing, and all the safety systems and there was no other vulnerabilities found in that vehicle other than what NHTSA originally found; that the situation that Ms. Smith encountered was floor mat entrapment" (Millar 2011).

The Perpetual Fear Machine

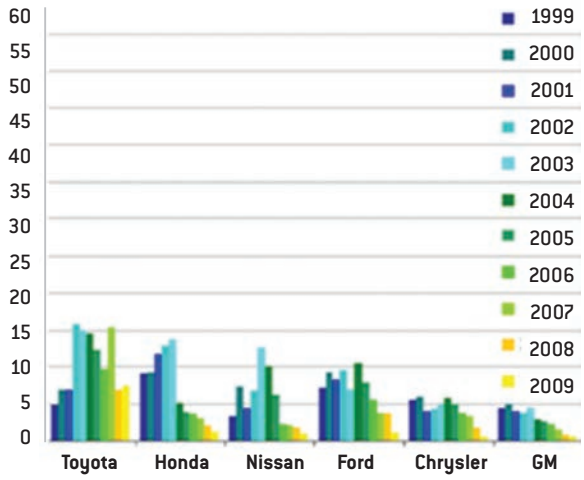
Physicists insist there's no such thing as a perpetual motion machine. They're wrong. By March 2010, media scare stories prompted so many Toyota SUA entries that NHTSA's computers groaned under the weight. That's when the media began their "scientific analyses" of the so-called database. You know, the one with time-traveling cars.

The New York Times ran a graph[3] on March 2 indicating that Toyota had the worst "complaint" record of five automakers, both for speed control and accidents associated with speed control. *USA Today* asserted (Healey and DeBarros 2010) that Toyota "speed control problems are a higher proportion of Toyota's driver complaint filings than they are for other big automakers," specifying five other companies. A March 15 *Washington Post* chart (Anywyl 2010) showed Toyota as having the worst complaint record among six automakers. Five makers? Six? There are dozens of companies that sell cars in America. Why didn't we hear about any others? Could some of them have had more complaints, even without media-generated hysteria? Yes, indeed. The cut-off was arbitrary and capricious.

As it happens, NPR had a database (NPR 2010) of NHTSA entries, no longer maintained but carried through to at least March 3, 2010, when I consulted it. It allowed easy speed control entry searches by model and year. It permits you to see at a glance that while the *Los Angeles Times* asserted (Bensinger and Vartabedian 2009b), "Cars made by Toyota registered far more complaints

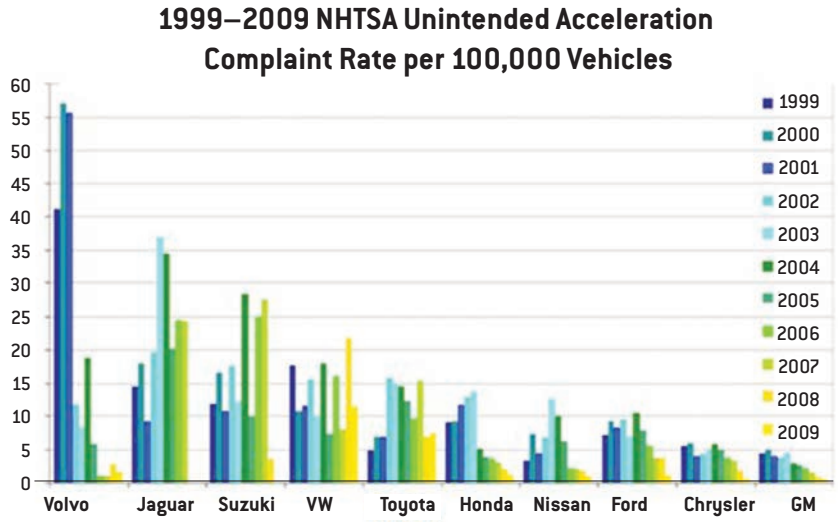
News reports arbitrarily cut off the car makers' data to make it appear that Toyota had the most complaints (see chart at right). In fact, when the full data of the ten top-selling automakers are shown (see chart on p. 48), four makers had a worse complaint record than Toyota.

1999–2009 NHTSA Unintended Acceleration Complaint Rate per 100,000 Vehicles*



***Through March 3, 2010**

Source: NPR Vehicle Acceleration Complaints, http://npr.org/templates/story/story.php?storyid=124235858, graphic courtesy of Wikipedia



*Through March 3, 2010

Source: NPR Vehicle Acceleration Complaints, http://npr.org/templates/story/story.php?storyid=12423585, graphic courtesy of wikipedia

about sudden acceleration in its 2008 model-year vehicles than any other automaker," in fact Volkswagen-Audi had three times Toyota's rate of entries per vehicle sold that year.

The Wikipedia entry for "sudden unintended acceleration" uses the NPR database to create a remarkable bar graph, displaying NHTSA entries for the top ten U.S. auto sellers since 1999. It shows that while the aforementioned analyses portrayed Toyota's "complaints" as shown in the chart on p. 47, the full picture actually looks like the chart at the top of this page.

What if the public had been informed that just one other car company had even more complaints than Toyota, much less four major ones? *Just one*?

It's sad that "witch hunt" has become a cliché, because sometimes it's simply the best allegory. Like the "witches" of yore, Toyota was accused of making cars that did that which cars simply cannot do, and indeed lacking scientific explanations both the media and its anointed experts turned to such terminology as "demons" and "ghosts." In what may ironically be considered the ultimate verdict on Toyota, at the press conference there was no allegation that Toyota had ever actually sold defective cars. Attorney General Eric Holder at the March press conference merely claimed (Robillard 2014) Toyota hadn't cooperated fully or in what the government deemed a proper manner. No mention of injuries or deaths because there were none.

In other words, the witch had dared to struggle on the way to the stake. ■

Notes

1. NHTSA actually has no data category for "sudden acceleration," rather such entries appear under "vehicle speed control." But it appears roughly 90 percent of mentions do concern SUA, so that term will normally be used. NHTSA also doesn't distinguish between complaints and comments, so normally the term "entry" will be used.

2. Photograph online at http://www.mibz.com/wp-content/uploads/2010/03/Toyota-Prius-Police-Car.jpg.

3. Graphic original to *The New York Times*. Online at http://www.nytimes.com/imagepages/2010/03/02/business/global/02toyotaGraphic.html?ref=business.

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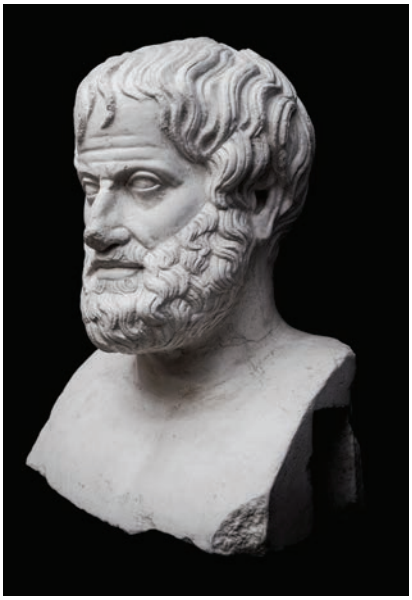
The Rhetoric of Extraordinary Claim

Although unfamiliar to many skeptics, rhetorical analysis can provide a useful complement to the traditional critical thinking approaches that comprise the "skeptic's toolbox."

PETER J. MARSTON

For the past ten years, I have taught a course titled "The Rhetoric of Extraordinary Claim" in the Communication Studies Department at California State University, Northridge. It is, to my knowledge, the only course in the country promoting skeptical thinking that is offered from a distinctly rhetorical perspective. I note this not as a boast of my singular insights or abilities but rather as the cry of a lone man in the wilderness. Indeed, this article is a signal flare; its purpose is to alert the readers of the Skeptical Inquirer to the ways in which rhetorical analysis provides a useful, and sometimes crucial, complement to the traditional critical thinking approaches that dominate contemporary skeptical writing.



Certainly, the place to begin is to clarify what I mean by the term rhetoric. The term has several different meanings, of course—some of them pejorative—but here I use the term in its most traditional sense: the persuasive aspect of discourse. Aristotle, for example, provides what is still the most fundamental definition of rhetoric as "the faculty of observing in any given case the available means of persuasion" (Aristotle 1954, 24). The most important contemporary definitions barely stray from this central meaning: "the use of language as symbolic means of inducing cooperation" (Burke 1953, 43), "the discursive means of obtaining the adherence of minds" (Perelman 1969, 8), "the literary technology of persuasion" (Quine 1989, 183), and so on.

Given this conception of rhetoric, it is easy to distinguish rhetorical analysis from the types of analysis typically associated with critical thinking. Traditional critical thinking approaches emphasize the *strength* of arguments, focusing almost exclusively on the soundness of the reasoning and the reliability of the evidence. Rhetorical analysis, on the other hand, emphasizes the *appeal* of arguments—what makes the argument persuasive to an audience. Now, although these approaches are different in emphasis, they are not mutually exclusive, as the strength of an argument can (and surely should) be an important basis for the appeal of an argument. Still, there are many other features of arguments that contribute to their appeal but are not systematically considered in traditional critical thinking approaches—the use of particular types of language and commonplaces, the temporal progression of the argument, and the tone of voice or expression, among others. Undoubtedly, some of these features of arguments may be sophistic—misleading or beguiling—and, in fact, make an argument weaker rather than stronger, but in either case, understanding the rhetorical appeal of discourse advancing extraordinary claims can improve our ability to evaluate and disarm such discourse.

Now, if the reader of this article is expecting a dedicated and comprehensive theory of the rhetoric of extraordinary claims, I will no doubt disappoint, as no such theory will be presented. Indeed, I would argue that no such theory is necessary, as the ex-

isting body of rhetorical theory is more than sufficient to do the job. From the ground-laying works of Plato and Aristotle to the contemporary theories of writers such as Kenneth Burke and Jean Baudrillard, the materials of rhetorical analysis are already established and merely await the attention and application of skeptical writers and critics.

Specifically, I seek to address two central questions:

1. What constitutes a rhetorical analysis of discourse advancing extraordinary claims?

2. What advantages might emerge from using rhetorical analysis to complement the traditional critical thinking approaches that comprise the "skeptic's toolbox"?

The Rhetorical Analysis of Discourse Advancing Extraordinary Claims

The classical—and still most influential—survey of the scope and varieties of rhetorical appeals appears in Aristotle's treatise, the *Rhetoric*. In this work, Aristotle posits four categories of rhetorical appeals: [1] those deriving from the materials or content of the discourse (these he terms "proofs"), [2] those deriving from the organization or placement of these materials, [3] those deriving from the expression of these materials in particular linguistic statements, and [4] those deriving, in oral discourse, from the delivery or performance of the speaker. (These categories would later be codified by Cicero as the "canons" of rhetoric: invention, arrangement, style, and delivery, respectively.[1])

The first of Aristotle's categories, invention, consists of the speaker's ability to generate or discover the persuasive material that is the content of the discourse. It is the most developed of the canons, both in Aristotle's *Rhetoric* and in the considerable body of literature associated with the rhetorical tradition. In conceptualizing rhetorical invention, Aristotle identifies three central types of proofs: *logos*, *ethos*, and *pathos*.

Logos is the logical aspect of proof—what we recognize as the inferential structure of an argument. *Logos* determines the soundness of an argument and is the main concern of traditional critical thinking approaches, especially through the identification of logical fallacies and other instances of unwarranted inference.

Ethos is the ethical aspect of proof. It is manifest in the values embodied by the discourse. Lincoln's Gettysburg Address, for example, is persuasive not primarily because of the quality of the reasoning but because of the quality of the values affirmed: liberty, equality, and commitment to purpose. While *ethos* is significantly less prominent in the types of critiques found in the Skeptical Inquirer, when skeptics base their analysis in the criteria of scientific adequacy, this is essentially an assessment of *ethos*, as these criteria are fundamentally held as values rather than deduced as facts.

Pathos is the emotional aspect of proof. Critical thinking approaches tend to consider appeals to emotion only when they appear in well-established fallacies, such as appeals to fear and appeals to pity. However, Aristotle identifies a more general function for *pathos* in rhetorical discourse. He maintains that the principal function of emotional appeals is to place an audience in a particular emotional state that will prepare them to be receptive to the logical or ethical proofs that follow. For example, Copernicus begins *On the Revolutions of the Heavenly Bodies* with a dedication to Pope Paul III that is essentially an appeal to humility. It prepares the audience for later arguments that may otherwise have been taken as arrogant or blasphemous (Copernicus 1972, 3–5). Such an emotional appeal does not contribute to the soundness of the later arguments—nor is it properly considered a fallacy as it is not offered as a reason *per se*—but nonetheless it contributes significantly to the rhetorical appeal of the work.

Now, in discourse advancing extraordinary claims, appeals to emotion are prevalent, and understanding that *pathos* is by nature preparatory may be useful to those engaged in skeptical critique. For example, a séance is typically front-loaded with appeals to affiliative emotions and sometimes to grief, not to demonstrate the veracity of communication with the dead but to render the audience susceptible to the improbable demonstration to follow. This type of observation results in a more accurate understanding of how a séance works in relation to its audience and also can disarm its persuasive impact by explicitly revealing the rhetorical tactics employed.

One instance in which arrangement is sometimes the focus of skeptical critiques is cold reading, in which the sequence of topics and the attendant questions—moving from general and ambiguous to specific and concrete—is seen as key in understanding how psychics seek to establish credence in their claims.

The second of Aristotle's categories, arrangement, is rarely recognized in traditional critical thinking approaches. Still, the sequence of arguments or appeals may be central to the overall effect of discourse advancing extraordinary claims. One instance in which arrangement is sometimes the focus of skeptical critiques is cold reading, in which the sequence of topics and the attendant questions—moving from general and ambiguous to specific and concrete—is seen as key in understanding how psychics seek to establish credence in their claims. An-

other example of the importance of arrangement is the way in which infomercials for miracle diets or exercise equipment typically place extensive testimonials before any explanation of the product's function, seeking to produce a favorable attitude toward the product. Again, sequence is central to explaining how the discourse seeks to persuade its audience.

The third of Aristotle's categories is style—the particular linguistic expression of the various ideas and proofs that constitute the material of rhetorical discourse. Style has been of great importance in rhetorical studies, as language choice is pivotal in communicating ideas persuasively. After all, no one would remember Martin Luther King Jr.'s landmark address if it had been called "I Have an Idea." Although stylistic concerns are seldom central to skeptical critiques, one area in which language choice is often considered is pseudoscience, in which couching dubious claims in scientific or scientific-sounding language is widely recognized as a primary strategy in advancing pseudoscientific claims.

The fourth and final of Aristotle's categories is delivery—the ways in which tone of voice, vocal phrasing, gestures, and other aspects of the physical performance of speech can contribute to persuasion. Delivery is not germane, of course, to the analysis of written texts, but much discourse advancing extraordinary claims takes place through speech, as in a séance or the recruiting protocols of Scientology, or through forms of recorded speech, such as infomercials or the many paranormal and cryptozoological programs popular on television.

Although delivery, like most of Aristotle's latter categories, is rarely mentioned in traditional critical thinking approaches, it is clear that it can be very important in advancing extraordinary claims. The dramatic and sometimes otherworldly intonations of a medium at a séance, the measured pedantry of those presenting themselves as medical experts in infomercials, or the unmeasured enthusiasm of those providing testimonials for alternative treatments probably contribute as much to the persuasive appeal of the discourse as any of Aristotle's categories.

The dramatic and sometimes otherworldly intonations of a medium at a séance, the measured pedantry of those presenting themselves as medical experts in infomercials, or the unmeasured enthusiasm of those providing testimonials for alternative treatments probably contribute as much to the persuasive appeal of the discourse as any of Aristotle's categories.

To be sure, Aristotle's rhetorical theory provides the broadest and most clearly organized survey of the means of persuasion. Still, there are many other significant theorists in the rhetorical tradition whose works can profitably inform skeptical critique. It is beyond the scope of this article to provide even a cursory survey of this tradition, but I would like to consider briefly two of the most influential contemporary theorists to illustrate the point.

The most significant rhetorical theorist of the twentieth century is literary critic Kenneth Burke. According to Burke (1953), rhetorical effects occur not strictly through the presentation of proofs to a rational audience but more broadly through the use of signs of *consubstantiality* that create identification between speaker and audience. A sign of consubstantiality is a symbolic behavior that indicates shared substance. So, for example, in 2008, Barack Obama invoked hope and change not as reasons to vote for him so much as tokens of a shared progressive identity.

Much of what occurs in discourse advancing extraordinary claims reflects just this type of identification. New Age discourse, for example, derives its appeal not from its reasoning but from the use of a nomenclature that identifies the proponent and prospective adherents as spiritually enlightened and historically ascendant. Terms in this nomenclature include *aura*, *Aquarian age*, *astral body*, *channeling*, *harmonic convergence*, *transfiguration*, and the like.

Another example can be found in the discourse promoting 9/11 conspiracy theories. When a conspiracy theorist uses a term like *truther*, what is identified is not so much a relationship to a set of facts or forensic conditions but rather a social relationship—a shared substance—with others who believe "the truth is out there." This social relationship is maintained through a wide variety of communication practices—from websites, blogs, and conventions to representations in documentary and fictional discourse—all clear examples of what Burke conceptualizes as signs of consubstantiality.

A final theorist I want to mention is Jean Baudrillard, a postmodern critic and philosopher. Baudrillard (1983) maintains that, in postmodern discourse, rhetorical function is produced not through reference to an objective world but through the simulation of prevailing models of meaning. One clear example of this type of simulation is lifestyle advertising. In lifestyle advertising there is often no reference to the product or its intended use; instead you see symbolic models or archetypes of the "good life"—attractive people having fun and enjoying leisure and affluence. This simulation may lead the audience to consume the product in their own simulation of the

"good life," thereby fulfilling the ad's intended rhetorical function.

This type of simulation is evident in much contemporary discourse advancing extraordinary claims. You can't read self-reports of encounters with ghosts or the memoir of an alien abductee without realizing that what is being recounted are not events so much as archetypal narratives that serve as our models of such experiences. That movies and television shows provide so much of the content of these models only underscores the subsequent reprisal of these narratives in purportedly authentic and sincere self-reports as largely, if not entirely, simulations. While some such reports may be hoaxes or deceptions, it is likely that many are simulations—suggestible people reproducing prevailing models of meaning.

More typical examples of this type of simulation come from mediated discourse. An infomercial or website touting a new, but dubious, medical or scientific breakthrough (such as those promoting Thought Field Therapy, Power Balance bracelets, or various miracle diets) typically does not *report* a scientific breakthrough—indeed, there is no breakthrough to report—but rather *simulates* such a report. The simulation has all the attendant touchstones: talking-head interviews with scientific researchers or medical practitioners, scientific explanations (often accompanied by simple animations illustrating physical, chemical, or cellular processes), and references to published studies (though rarely citations), all often presented by hosts purporting to be science, medical, or fitness journalists. The rhetorical effect produced by these infomercials and websites does not arise from any representation of an objective reality but from our symbolic models of what a "scientific breakthrough" is and how it is reported. This is the hallmark of simulation.

Advantages of Rhetorical Analysis

I hope that this short survey demonstrates clearly the relevance of rhetorical analysis to both understanding and critiquing discourse advancing extraordinary claims. In this final section, I enumerate three general advantages of using rhetorical analysis to complement the traditional critical thinking approaches that are no doubt more familiar to the skeptical community.

First, theoretical frameworks from the rhetorical tradition (such as those outlined above) can integrate and contextualize many of the observations often made in passing or parenthetically in skeptical critiques. Indeed, many of the examples given in the previous section may be familiar to readers of the Skeptical Inquirer, but virtually none have been correctly or explicitly situated in relation to rhetorical function or appeal. Awareness and application of concepts and materials from the rhetorical tradition can move these observations from the periphery and place them properly within the scope of skeptical critique. This alone would strengthen both the substance and the clarity of much skeptical writing.

Second, these same rhetorical theoretical frameworks can promote a more systematic and comprehensive analysis of discourse advancing extraordinary claims. As I have noted, skeptics occasionally offer observations that are really more aligned with rhetorical analysis than with critical thinking *per se*. These observations are almost always just that—occasional—offered only as they occur to the skeptic. If skeptical writers were more familiar with rhetorical concepts and principles, such observations could be developed systematically and even programmatically, mitigating the possibility that important rhetorical appeals will go unnoticed, eluding explanation and critique.

Third, and perhaps most important, rhetorical analysis may help generate effective responses to discourse advancing extraordinary claims. Without question, investigating and debunking remain the central components of almost any response to paranormal or pseudoscientific discourse, but identifying rhetorical subterfuge can also be very effective. In my own classes, I have found that explaining how front-loaded emotional appeals may charm an audience, how New Age terms are markers of social identification, or how the Power Balance website is a simulation of scientific reporting will quickly diffuse whatever appeal the respective discourse may have had initially. As Gary Cronkhite astutely observes, "The best antidote for a sophistic rhetor is a sophisticated rhetoree and we had best get at the business of producing such an antidote" (Cronkhite 1974, 262).

Near the beginning of this article I presented a very direct definition of rhetoric as the persuasive aspect of discourse. There is, however, a more artful definition that I generally prefer and that I think gets closer to the point here: there is a difference between the way things are and the way we talk about them; rhetoric is the study of that difference. To this end, it should be clear that rhetorical analysis deserves a place alongside the methods of traditional critical thinking in the "skeptic's toolbox." ■

Note

1. Cicero also adds a fifth canon, memory, to describe those rhetorical appeals that derive from a speaker's ability to master facts and commonplaces in his or her memory.

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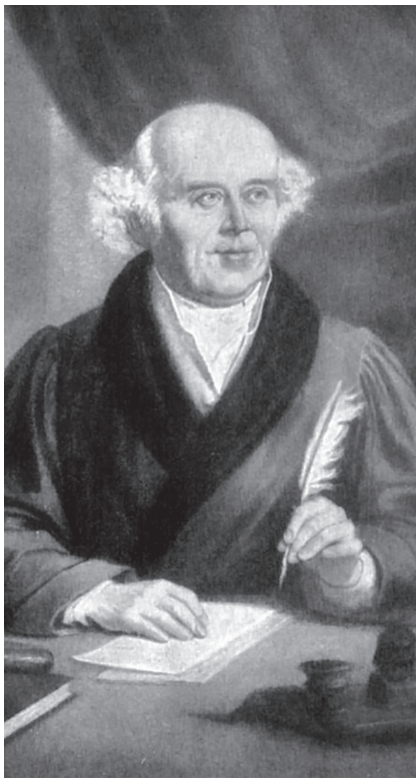
An Introduction to Homeopathy

A brief guide to a popular alternative system of remedies based on a nineteenth-century concept that has no scientific validity.

HARRIET HALL

Homeopathy is an alternative system of medicine that was invented by a German doctor at the beginning of the nineteenth century. Scientific knowledge about chemistry, physics, and biology tells us it *should not work*; careful testing has shown that it *does not work*.

In 1800, conventional medicine was a disaster. Doctors weakened patients with bloodletting and purging, they poisoned them with mercury and other harmful substances, and they often killed more patients than they cured. Dr. Samuel Hahnemann was looking for safer, more effective ways to help his patients. He had an epiphany after he took a dose of cinchona bark and developed symptoms similar to those of malaria, the disease cinchona was supposed to treat. He extrapolated from this one observation to conclude that if any substance *causes* a symptom in healthy people it can be used to *treat* the same symptom in sick people. He formulated this as the first law of homeopathy, *similia similibus curentur*, usually translated as "like cures like." He diluted his remedies so that they would no longer cause symptoms; this led to his second law of homeopathy, the law of infinitesimals, which states that dilution increases the potency of a remedy. When he observed that his remedies worked better during house calls than in his office, he attributed it to jostling in his saddle bags, so he added the requirement of "succussion," specifying that remedies must be vigorously shaken (not stirred) by striking them against a leather surface at every step of dilution.



Dr. Samuel Hahnemann, originator of homeopathy

Homeopathic remedies are usually labeled with the notation X or C, corresponding to ten and one hundred. 15C would mean that one part of remedy was diluted in 100 parts of water, one part of the resulting solution was again diluted in 100 parts of water, and the process was repeated fifteen times. Hahnemann died before Avogadro's number was available to calculate how many molecules are present in a volume of a chemical substance. Today we can calculate that by the thirteenth 1:100 dilution (13C), no molecules of the original substance remain. Hahnemann typically used 30C remedies. At 30C, it would take a container thirty million times the size of Earth to hold enough of the remedy to make it likely that it would contain a single molecule of the original substance. The most popular homeopathic cold and flu remedy is sold as a 200C dilution, and there are even higher dilutions. Above the 1,000C level there are remedies designated as

multiples of M, where 1M=1,000C.

An example will clarify the mind-boggling implausibility of homeopathy. If coffee keeps you awake, according to homeopathy dilute coffee will put you to sleep. The more dilute, the stronger the effect. If you keep diluting it until there isn't a single molecule of coffee left, it will be even stronger. The water will somehow remember the coffee. If you drip that water onto a sugar pill and let the water evaporate, the water's memory will somehow be transferred to the sugar pill, and that memory of coffee will somehow enable it to function as a sleeping pill.

Later in his career, in order to explain the failures of homeopathy, Hahnemann came up with the idea that all disease is due to three miasms: syphilis, sycosis (gonorrhea), and psora (scabies, or itch). These could be inherited or the result of an infection; they had to be cleared before the homeopathic remedy could work.

Anything could be a homeopathic remedy. Soluble materials could be diluted in water or alcohol. Nonsoluble materials could be ground into powder (triturated) and diluted with sugar (lactose powder). Among remedies listed in the homeopathic *Materia Medica* are powder ground from pieces of the Berlin Wall, eclipsed moonlight, the south pole of a magnet, dog's earwax, tears from a weeping young girl, rattlesnake venom, and poison ivy.

To find out which remedy does what, they are tested—not by controlled scientific studies but instead by "provings." Healthy people ingest the substance and report *everything* that happens to them (for example, "my big toe itched at midnight, I got heartburn after eating a big meal, I felt angry"). There is no attempt to separate the ordinary vicissitudes of everyday life from symptoms caused by the substance. These reports are then compiled into a *Repertory* where the homeopath can look up a patient symptom or characteristic to see what remedies had been associated with it in the provings. For instance, there are twenty-nine listings for a patient's facial expression, including astonished, bewildered, anxious when a child is lifted from a cradle, besotted, cold, and so on. A single remedy is listed for "cold"; seventeen are listed for "besotted."

The homeopath then consults a second book, a *Materia Medica*, for a list of symptoms that are associated with each remedy. For natrum muriaticum, the book lists symptoms in all these areas: mind, head, eyes, ears, nose, face, stomach, abdomen, rectum, urine, male/female, respiratory, heart, extremities, sleep, skin, fever, and modalities. Examples of symptoms listed under those categories include eyelids heavy; anemic headache of schoolgirls; constipation; diarrhea; sensation of coldness of heart; palms hot and perspiring; hangnails; dreams of robbers; oily skin; warts on palms of

Among remedies listed in the homeopathic *Materia Medica* are powder ground from pieces of the Berlin Wall, eclipsed moonlight, the south pole of a magnet, dog's earwax, tears from a weeping young girl, rattlesnake venom, and poison ivy.

1857 painting by Alexander Beydeman showing historical figures and personifications of homeopathy observing the brutality of medicine of the nineteenth century.

hands; chill between 9 and 11 AM, and so on for many pages. What is natrum muriaticum? Common table salt.

The initial consultation with a homeopath typically lasts an hour. He inquires about every conceivable aspect of the patient's life; keep in mind that for an accurate homeopathic diagnosis he must know about matters such as whether your eyelids are heavy or whether you have dreamed about robbers.

They pick the remedy that they deem to be the best match for you. If you get worse, they may tell you aggravations are a good sign. They will reevaluate you at every visit and change remedies as needed until one finally seems to do the trick or your illness runs its course and your symptoms have had time to go away on their own. If the treatment fails, they are never at a loss for excuses; they may tell you it's your fault because you inactivated the remedy by drinking coffee, not getting enough sleep, using a cellphone, or eating spicy foods.

In his book *Homeopathy: How It Really Works*, Jay Shelton examines all the evidence and concludes that homeopathy often "works," but not because of the remedies. The response to treatment is due to non-remedy factors such as unassisted natural healing, attention, suggestion, placebo effects, regression to the mean, the cessation of harmful or unpleasant treatments, lifestyle-assisted healing, or a difference in the patient's perception of internal versus external reality.

Homeopaths have made numerous attempts to justify their remedies in light of science. They have compared the remedies to vaccines, but vaccines are very different from homeopathic remedies because they contain measurable numbers of antigen molecules, they act by well-understood scientific mechanisms, and their results can be quantified by measuring antibody titers. Homeopaths have appealed to hormesis, a phenomenon whereby a low dose of a chemical may trigger the opposite response to a high dose. But hormesis is questionable, and if it exists in some cases, it's not a universal phenomenon by any means; it also describes a response to a *low* dose, not to *no* dose. Defenders of homeopathy have also invoked "water clusters" as a way water might store information; clusters of water molecules do form, but they only last for trillionths of a second, and there's no way they could register or transmit information. They have tried to attribute homeopathy's effects to quantum entanglement, with ill-informed Chopra-like speculations that would leave a quantum physicist rolling on the floor with laughter. They have done fatally flawed experiments trying to prove that water can remember, as if that alone would somehow validate clinical treatments. The most famous was Jacques Benveniste's study, published in *Nature* (see http://en.wikipedia.org/wiki/Jacques_Benveniste), demonstrating that he could detect the biological effect of antibodies after they had been diluted out of a solution. A subsequent *Nature* investigation showed that the positive results were all from one technician and were best explained by poor controls and inadequate blinding procedures; attempts to replicate his findings failed (Maddox et al. 1988).

Homeopaths sometimes argue that because homeopathy is individualized, it can't be tested in randomized controlled trials or judged by the same standards as conventional medicines. They are wrong: it can.

Homeopaths sometimes argue that because homeopathy is individualized, it can't be tested in randomized controlled trials or judged by the same standards as conventional medicines. They are wrong: it can. Homeopaths could individualize their prescriptions as usual, the remedies could be

randomized and coded by a second party, and they could be dispensed by a blinded third party who didn't know whether what he was handing out was what the homeopath ordered or a substitute. Homeopaths involved in designing homeopathy studies have conspicuously chosen not to design them this way.

The implausibility of homeopathy wouldn't matter if it could be shown to work. When penicillin was first used, no one understood *how* it worked; however, it was immediately obvious that it *did* work, so doctors started using it right away, and only much later figured out that it kills bacteria by interfering with their ability to manufacture cell wall components. If the evidence for homeopathy's effectiveness were as strong as the evidence for penicillin, it would have readily been adopted into mainstream medicine.

If the evidence for homeopathy's effectiveness were as strong as the evidence for penicillin, it would have readily been adopted into mainstream medicine.

Medicines at a homeopathy pharmacy in Varanasi, India

There have been a number of positive clinical studies of homeopathy, but the effects have been inconsistent and small in magnitude. We know that there are many reasons an ineffective treatment may appear to work in a study. The better the design of a homeopathy study, the more likely it is to have negative results, and the best-designed studies have been consistently negative. Systematic reviews fail to support homeopathy. A 1997 meta-analysis published in the *Lancet* concluded that homeopathy worked better than placebo but was not effective for any single clinical condition (online at http://www.ncbi.nlm.nih.gov/pubmed/9310601). That's like saying that broccoli is good for everyone—but not men, women, or children! In 2002 Edzard Ernst did a systematic review of systematic reviews (Ernst 2002) that showed homeopathy was no better than placebo.

Homeopaths love to cite statistics from nineteenth-century cholera and typhoid epidemics where patients treated with homeopathy were more likely to survive than patients treated with conventional medicine. Those historical successes are easily explained. Doctors of the time were using remedies that often actively caused harm, but homeopathic remedies did nothing so of course the results were better. Homeopathy was just a way of avoiding iatrogenic harm. Conventional medicine has made a lot of progress since then. The "What's the Harm?" website offers numerous modern examples of patients who died because they chose homeopathy over conventional treatment that could have saved their lives.

One real danger of homeopathy is in the area of vaccines. Unlike real vaccines, homeopathic vaccines contain no antigen molecules, so they can't possibly produce immunity. People are deluded into believing they are protected from vaccine-preventable diseases when they are actually putting themselves at risk and putting others in their community at risk by decreasing the herd immunity. In a United Kingdom study, experimenters posed as patients planning a trip to Africa and asked homeopaths what they should do to prevent malaria. Ten out of ten homeopaths advised homeopathic "protection" instead of conventional malaria prophylaxis. One said, "They make it so your energy—your living energy—doesn't have a kind of malaria-shaped hole in it. The malarial mosquitoes won't come along and fill that in. The remedies sort it out." (See http://www.badscience.net/2006/09/newsnight-

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There are other risks. Sometimes a homeopathic remedy is not dilute enough and has actual harmful physiological effects. A homeopathic teething remedy was recalled in 2010 because it contained varying amounts of belladonna and children taking it had suffered seizures consistent with belladonna poisoning. In 2014 several homeopathic products were recalled because they contained actual drugs: measurable amounts of penicillin. (See http://www.fda.gov/safety/medwatch/safetyinformation/safetyalertsforhumanmedicalproducts/ucm390002.htm.)

Too many people assume that anything on the shelves of a store must have been approved as safe and effective by the government and that false or misleading advertising claims are strictly prohibited and promptly punished. Unfortunately, this is not true.

Homeopathy is big business. The homeopathic flu remedy Oscillococcinum is one of the ten top-selling drugs in France, and it brings in $15 million a year in the United States. This one is particularly illogical, since the original substance never actually existed. A French doctor looked through a microscope at blood samples from victims of the 1918 Spanish flu epidemic and observed the phenomenon known as Brownian motion, where visible particles are jostled by collisions with water molecules. He didn't recognize it as Brownian motion but imagined he had discovered a hitherto-unknown oscillating bacterium. He christened it Oscillococcus; then he imagined he saw the same bacteria in a sample of duck liver. The Oscillococcinum sold today is a 200C dilution of a smidgen of a Muscovy duck's heart and liver. The liver is long gone but the quack is still evident.

Too many people assume that anything on the shelves of a store must have been approved as safe and effective by the government and that false or misleading advertising claims are strictly prohibited and promptly punished. Unfortunately, this is not true. In the United States, prescription drugs must be proved safe and effective before the FDA will approve them for marketing, but homeopathic remedies are not required to undergo any kind of testing. The whole homeopathic pharmacopoeia was grandfathered in without question. Homeopathic remedies were exempted from federal regulations governing other medications by legislation passed in 1938 at the instigation of senator and homeopath Royal Copeland.

As early as 1842, it was obvious to thinking people like Oliver Wendell Holmes that homeopathy was pseudoscientific nonsense. He exposed its silliness in his classic essay "Homeopathy and Its Kindred Delusions," which is available on the Internet and is still well worth reading. Homeopathy has also been referred to as "Delusions About Dilutions." James Randi has a standing offer of $1 million to anyone who can distinguish a highly dilute homeopathic remedy from plain water, and he's in little danger of losing his money.

So, why is it still being used? There are several reasons. Many consumers have no understanding of what homeopathy actually is and even many medical professionals have only a vague impression that a homeopathic remedy is some kind of mild natural herbal remedy. The remedies are harmless, whereas real medicines have real side effects. The remedies are much less expensive than prescription drugs. Patients love the long appointments and individual attention that they don't get from their medical doctors. Or they enjoy the independence of choosing their own homeopathic remedy and treating themselves. Or they trust the testimonials of friends who believe it cured them. Or they have tried it and have become convinced that it works. Unfortunately, when people rely on personal experience, they are just not very good at determining whether a remedy works: that's why we need science. ■

For Further Reading

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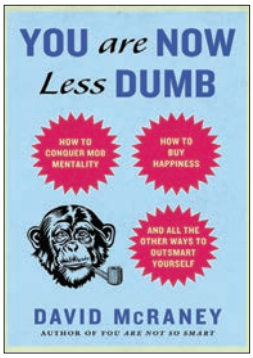
Harriet Hall, MD, a retired Air Force physician and flight surgeon, writes and educates about pseudoscientific and so-called alternative medicine. She is a contributing editor and frequent contributor to the SKEPTICAL INQUIRER, a CSI Fellow, and member of the CSI Executive Council. She is also an editor of the blog *Science-Based Medicine* and author of *Women Aren't Supposed to Fly: Memoirs of a Female Flight Surgeon* as well as coauthor of the 2012 textbook *Consumer Health: A Guide to Intelligent Decisions*.

How to Be Less Dumb

DANIEL GRASSAM


YOU are NOW
Less DUMB
HOW TO CONQUER MOB MENTALITY
HOW TO BUY HAPPINESS
AND ALL THE OTHER WAYS TO OUTSMART YOURSELF
DAVID McRANEY
AUTHOR OF YOU ARE NOT SO SMART

You Are Now Less Dumb: How to Conquer Mob Mentality, How to Buy Happiness, and All the Other Ways to Outsmart Yourself. By David McRaney. Gotham Books, New York, 2013. ISBN 978-1592408054. 309 pp. Hardcover, $22.50

From the self-described psychology nerd who brought us *You Are Not So Smart* (reviewed in Skeptical Inquirer November/December 2012) comes his follow-up book *You Are Now Less Dumb*. "This is a book about self-delusion," states McRaney, but self-delusion, he asserts, is a part of being human and as such is not to be derided but accepted—celebrated even. Because "we're all in this together, and these are our shared mental stumbling blocks," McRaney wants us to "use what you learn here to be kinder to others and more honest with yourself," and ultimately, to become less dumb.

Continuing the format of his first book McRaney adds to the list of cognitive biases, faulty heuristics, and common fallacies of thought that keep us all from thinking as clearly and correctly as we would like. Topics range from the benign "no true Scotsman" and post hoc fallacies often cited in online arguments to the more potentially dangerous phenomenon of deindividuation. Deindividuation is the name for what happens in crowds when you lose your sense of self and you "dissolve into the collective will of the group." It can be the driving force behind rioting, looting, and masses of otherwise sane, caring, and sensible people yelling for a suicidal person to jump. It is scary to contemplate that given the right situation any one of us can be deindividualized, but if surrounded by positive cues, McRaney adds, this same force can lead to prosocial behavior. "The norms of the mob, good or evil, replace the norms of everyday life."

Another chapter discusses a relatively recent entry into the field of psychology, enclothed cognition. Psychologists Hajo Adam and Adam Galinsky introduced the term in 2012 to describe the influence clothes have on the wearer's psychological processes. Previous studies on clothing focused on priming or deindividuation, but Adam and Galinsky wanted to look deeper. Using experiments like testing people while wearing a lab coat they found that people performed better on attention-related tasks when wearing the lab coat. Their research indicates that the clothing people wear may "alter the wearers' attitudes and behaviors, making them more courageous or ethical or aggressive or compassionate or attentive."

McRaney closes the chapter on enclothed cognition by suggesting that readers "use that knowledge to be less dumb, and know that when you feel uncomfortable in a tuxedo or cocktail dress, part of that feeling comes from . . . the concepts it primes in your network of self." Other chapters also contain advice on how one can use the science to be less dumb. The chapter on pluralistic ignorance counsels "Encourage individuals to speak out and reveal their private thoughts." On the illusion of external agency, McRaney proposes that "to be less dumb is to see the danger in believing in forces that do not exist."

Whereas his first book covered forty-eight different cognitive short-comings, this book deals with just seventeen. Despite having fewer topics it is of an equivalent length because McRaney takes a bit more time on each subject. Gone is the rapid-fire pace of the first book. Chapters in *You Are Now Less Dumb* are twice as long on average, but don't let that dissuade you; this book will tax only the shortest attention spans because McRaney does a superb job of taking complex subjects and making them accessible. Though his frequent pop culture references will in a short time date the book, they are a companion to his conversational style. Like the first book, complete references to source material are included. It is not necessary to have read the first book to enjoy *You Are Now Less Dumb*, so pick up a copy and in McRaney's words, "proceed toward your epiphany." ■

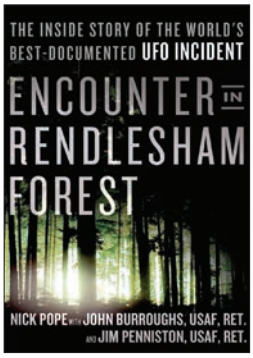
Daniel Grassam writes from his home in Auckland, New Zealand.

The Rendlesham UFO Incident: A Study in Folly

JAMES MCGAHA and JOE NICKELL

Arch UFO proponent Nick Pope served as an employee of the British Ministry of Defense and his varied duties included the part-time assessment of UFO reports for any possible defense significance. In 2009, the ministry determined there had never been any (pp. 168–169). Pope's views were once relatively cautious. He emphasized he was "wary of the UFOlogical obsession with official cover-ups and conspiracies," urging UFOlogists to "try to get away from the believers versus skeptic mindset," and insisting that "undisputed proof that we are not alone in the universe is more likely to come from optical or radio astronomy than from UFOlogy," according to Pope's entry in Ronald D. Story's 2001 *Encyclopedia of Extraterrestrial Encounters*.

Yet Pope's latest book, *Encounter in Rendlesham Forest*, is from the opposite perspective. Written with two retired U.S. airmen, John Burroughs and Jim Penniston (for a time stationed at twin U.S. air bases in Britain—RAF Bentwaters and Woodbridge—flanking Rendlesham), it describes what Pope calls "by far the best-documented and most compelling UFO incident ever to have taken place" (xvi). It also attempts to discredit skeptical theories and constantly speaks of secrecy, cover-up, and conspiracy.


THE INSIDE STORY OF THE WORLD'S BEST-DOCUMENTED UFO INCIDENT
ENCOUNTER IN RENDLESHAM FOREST
NICK POPE with JOHN BURROUGHS, USAF, RET. and JIM PENNISTON, USAF, RET.

***Encounter in Rendlesham Forest: The Inside Story of the World's Best-Documented UFO Incident*. By Nick Pope with John Burroughs, USAF (Ret.), and Jim Penniston, USAF (Ret.).** St. Martin's Press, New York, 2014. ISBN: 978-1-250-03810-4. 311 pp. Hardcover, $25.99.

Encounter in Rendlesham Forest **describes what Pope calls "by far the best-documented and most compelling UFO incident ever to have taken place." It also attempts to discredit skeptical theories and constantly speaks of secrecy, cover-up, and conspiracy.**

What has happened to Nick Pope? Several things: He seems newly interested in salesmanship, stating, "This is a timely book," in part, he says, because of modern "concerns over government secrecy" (xix). Second, he has teamed up with Burroughs and Penniston, who have become the embodiment of what we call "The Roswellian Syndrome."

As we explained in the May/June 2012 issue of Skeptical Inquirer, this syndrome refers to "a UFO incident's occurring, being debunked, go ing underground, beginning the myth-making processes, and reemerging as a conspiracy tale with ongoing mythologizing and media hype." That is what happened with the Roswell incident, the 1947 crash of a U.S. spy balloon array that morphed over time into a tale of crashed saucers and their humanoid occupants.

At Rendlesham, the initial sighting

of early December 26, 1980, occurred at the same time that a bolide (a brilliant meteor) streaked over southern England. As local police soon determined, an additional light visible from the area was from the Orford lighthouse that stood in the direction the airmen were looking and *flashed at the same five-second interval as the UFO*. Other claims were likewise debunked, including certain red and blue lights (a police car), "landing" depressions (rabbit diggings), and "burn marks" on pines (axe blazings oozing resin). The low radiation readings had been taken with equipment that was not intended to measure background radiation and so were meaningless. The "star-like objects" cited in Deputy Base Commander Charles Halt's memorandum report from January 13, 1981, were probably indeed stars: Sirius, Vega, and Deneb.

Case closed—for nearly three years.

Then, in October of 1983 the story resurfaced and was hyped, first in the British tabloid *News of the World* and then in a book, *Sky Crash: A Cosmic Conspiracy*, published the following year. Although one of that book's coauthors, British UFOlogist Jenny Randles, subsequently became a skeptic of the Rendlesham Forest case, the conspiracy was off and running.

Pope is bent on reviving the Rendlesham incident again. Unfortunately, in doing so he is shackled to Burroughs and Penniston. The two were USAF security personnel at Bentwaters/Woodbridge and were largely responsible for the initial misperceptions and hype—especially Airman Burroughs. After seeing unexplained lights, although lacking proper authorization, he went off base and saw the lights flashing red and blue. Soon, Sgt. Penniston (along with a few others) came on the scene and the two seemed to feed each other's developing hysteria. At one point, with a flash of light Penniston "was fear struck" and he and Burroughs threw themselves to the ground (1–8).

Over the years since the incident, matters have become still more confused, and the duo have had trouble keeping their stories straight. For example, although the earliest source, the Halt memo, says the UFO left "As the patrolmen approached the object" (74), Penniston would later claim to have actually touched the hard, smooth object and to have observed symbols thereon like "ancient Egyptian hieroglyphs" (clearly evoking the "hieroglyphs" previously reported on the Roswell debris). At the same time, Burroughs remembers almost nothing after the flash of light. And while Penniston now claims (says Pope) "the inspection of the craft took many minutes," for Burroughs, the interval between the time he hit the ground until the UFO departed "seemed like a few seconds" (6–9).

The responses of the USAF and the RAF appear to be mostly passive, as if they wish the original comedy of errors would simply go away and their serious military agencies would not be further threatened to become laughingstocks.

Even more unbelievably, over thirty years after the fact, Penniston produced his alleged notebook in which he had recorded an incredible secret from the encounter with the UFO. Not only had he touched the craft but he now claims in doing so to have received by "telepathic download" a "binary code message" (a string of ones and zeroes, running line after line, for sixteen pages). Under hypnosis, he says he learned that the entities were not ETs after all; "They are time travelers—they are us" (239). Who would venture to wager on what Jim Penniston will claim next?

Even Deputy Base Commander Halt's statements have become inflated over time. Whereas in 2007—describing lights he had witnessed on the night following the initial incident—he said he had "no idea" what he had seen. However, in 2010 he gave an affidavit (for reasons that are unclear) stating his belief that the lights "were extraterrestrial in origin" and that security forces in the U.S. and U.K. had "attempted—both then and now—to subvert the significance of what occurred at Rendlesham Forest and RAF Bentwaters by the use of well-practiced methods of disinformation" (41–42).

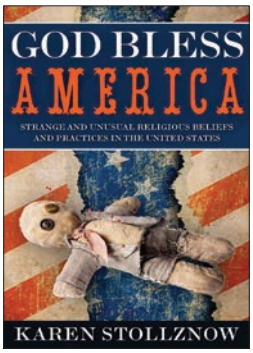
Actually, the responses of the USAF and the RAF appear to be mostly passive, as if they wish the original comedy of errors would simply go away and their serious military agencies would not be further threatened to become laughingstocks. In contrast, left looking very much like fools, Burroughs, Halt, and most especially the remarkable Penniston appear unable to see how their increasingly strident and exaggerated "memories" are making them appear like loose cannons indeed. They will, of course, sell some books, get some attention, and fool some people. ■

James McGaha, major, USAF retired, is a former special operations and electronic warfare pilot and now an astronomer and director of the Grasslands Observatory in Tucson, Arizona. He has frequently appeared as a UFO expert on such television shows as *Larry King Live*.

Joe Nickell, PhD, is CSI's senior research fellow. He is author (and coauthor or editor) of many investigative books, including *Entities* and *The UFO Invasion*, and he contributed to *The Encyclopedia of Extraterrestrial Encounters*.

A Skeptical Linguist Looks at American Beliefs

MARK NEWBROOK



God Bless America! Strange and Unusual Religious Beliefs and Practices in the United States. By Karen Stollznow. Pitchstone Publishing, Durham, North Carolina, 2013. ISBN: 1939578000. 256 pp. Paperback, $14.95.

Karen Stollznow is an Australian scholar who has long resided in the United States. She is a linguist and a skeptic, and indeed a skeptical linguist—but in *God Bless America!*, obviously, she is not mainly concerned with linguistic matters. There *are* here some topics where Stollznow's linguistic interests and knowledge come through, for example in discussions of glossolalia (speaking in tongues) and xenoglossia (speaking unlearned languages); the related topic of channeled languages; John Dee's supposed angelic language called "Enochian"; the inaccurate use of French and Latin in Satanic rituals; "backward masking"; and an issue associated with Electronic Voice Phenomena (EVP). But she certainly does not seek to foreground unduly her own main area of professional expertise, as some writers do. (For more links between religion and language that may be of interest to skeptics, see my article "Old-Time Religion, Old-Time Language," in the March/April 2007 Skeptical Inquirer, pp. 58–63.)

Stollznow demonstrates throughout that she is very well-informed about religion as well as language. Indeed, I myself learned much from her book; there are in fact some entire topics that are new to me, for example "Religious Science" (pp. 205–207). As far as I can see, there is very little in the book that might be challenged in respect of accuracy. The only point of a specifically linguistic nature that gives me pause is Stollznow's comment on p. 148 that Enochian has been "debunked." While the relevant skeptical treatise does—naturally—express reasoned doubt about this language, and especially about its allegedly mysterious source, I find myself unable to interpret it as achieving a palpable debunking or even as claiming to do so.

Unlike some skeptics, Stollznow does not fight shy of either the notoriously litigious Church of Scientology, or of those groups (such as the Quakers) that are regarded as relatively close to mainstream religion and thus as more socially respectable than out-and-out cults.

Following Stollznow's introduction, her nine chapters cover the Latter-Day Saints (Mormons), the Amish and the Mennonites, Charismatic and Pentecostal Christians, Voodoo and related belief systems, exorcism, Satanism, Scientology and its precursor Dianetics, "New Age" spirituality (a particularly broad topic), and the Society of Friends (Quakers). There are a few relevant belief systems that Stollznow does not concern herself with but that might have appeared here: Unarius, Urantia, maybe even Asatru, etc., and others that receive only cursory mention. But it would be unreasonable to expect *fully* comprehensive coverage of such a large and diverse topic. Perhaps a more serious issue involves the extreme brevity of the discussion of Wicca (on pp. 102–103, in the chapter on Voodoo). Wicca, which is widespread in the United States, surely deserves a fuller treatment, especially given the tendency to confuse it with Satanism (either out of ignorance or tendentiously). A smaller omission might be found in the relative brevity of Stollznow's treatment of the Mormons' theological doctrine as opposed to their social mores.

Unlike some skeptics, Stollznow does not fight shy of either the notoriously litigious Church of Scientology, or of those groups (such as the Quakers) that are regarded as relatively close to mainstream religion and thus as more socially respectable than out-and-out cults. Though it must be noted that her verdict on the Quakers, specifically, is (not for this reason) largely positive.

As a skeptic, Stollznow is evidently

and openly a "modernist," confident that some accounts of the world are preferable to others (especially where empirical issues are in question) and concerned with coherence and plausibility. Her approach (as is made explicit in her introduction) is respectful (of the sincere believer as opposed to the fraudulent self-promoter) but *not* accepting of ideas that appear not to hold up. She is hard-hitting where required; she displays concern for those taken in by palpable nonsense or fraud but unashamedly attacks inadequately supported empirical claims, poor logic, inconsistency, biased and inaccurate self-reporting, gullible and one-sided media treatment, etc. Though Stollznow says little about her own background and beliefs or lack thereof, she does report her own fieldwork, and her tone and style are personal and in places light without any concomitant loss of intellectual authority.

Stollznow's critical comments about the belief systems she surveys include references to a number of widespread problems in the relevant material, notably naively positive New Age attitudes to the vicissitudes of life, vaguely expressed claims regarding spirituality, and the conflict between rejection of science and the desire to invoke science, or at least the vocabulary of science. This last point is well illustrated (p. 204) by Frank Sumption's pseudoscientific invoking of the term *quantum* with, as he admits, no understanding of its technical scientific meaning. Because of the high status and mystique of science in the contemporary world, there is often a curious tension between dismissal of scientific (as of religious) orthodoxy as hidebound or worse and a continuing desire to be associated with science.

Stollznow's book can be recommended unreservedly to skeptics and others with an interest in the subject matter. ■

Mark Newbrook is a general and historical linguist who has worked in Singapore, Hong Kong, Australia, and his native United Kingdom. He is the author of *Strange Linguistics* (Lincom Europa, Munich, 2013), the first book-length general treatment of non-mainstream ideas about language.

[INBOX

Mount Rainier: UFO Magnet

The article by James McGaha and Joe Nickell ("Mount Rainier: 'Saucer Magnet'" May/June 2014) highlights the major UFO sightings near the mountain, but the area played another role in the UFO story. I was a park ranger at Mount Rainier National Park from 1977 to 1982. Outside the park entrance was the Cedar Park Lodge, owned by Wayne Aho, who said he had been contacted by aliens in the 1950s. He had a small New Age/UFO cult, and he established a "free landing zone" on the property. Periodically his group would meet and try to entice an alien ship to land.

One afternoon, I saw Aho and his wife sitting on the porch of the National Park Inn in Longmire. It was a beautiful day with a spectacular lenticular cloud around the mountain's summit. I had talked to them before, so I stopped to chat. They said they were enjoying the view and trying to figure out why alien spaceships tended to hide inside lenticular clouds.

I had not thought about this meeting in years, until I read the McGaha and Nickell article. A quick web search indicates that Aho's idea does not seem to have caught on in the UFO world, although there is a website (alienskyship.com) that has several pages on UFOs inside cloud formations.

John Conoboy
Corrales, New Mexico

Reasoned Look at UFO Thinking

The article by Matthew J. Sharps ("UFOs and Cognitive Science: A Case Study," May/June 2014) is a good example of why I continue to subscribe. It is reasoned, insightful, and instructive. I too have wondered how you become a "professional" in the UFO field, and I've noted the same small but highly available number of familiar faces still popping up over the past half-century, most of whom promote their "expertise" through self-published books. Professor Sharps's article adroitly places them in the right perspective.

Tom Parks
Midland, Texas

Selling Medical Pseudoscience

Of the many interesting articles in the May/June Skeptical Inquirer, "Selling Pseudoscience: A Rent in the Fabric of American Medicine" by Eugenie V. Mielczarek and Brian D. Engler is the most shocking. They report that over $2 billion of taxpayer dollars have been spent by NIH's NCCAM (National Center for Complementary and Alternative Medicine) in a little over a decade and nearly $130 million now a year, much of it going for research grants on alternative medicine. For grants going to seven alternative medical organizations they list a total seventy-three clinical trials, with thirty-one completed and a paltry four with posted results. It would be interesting to see how a comparable group of NIH research grants for mainstream scientific medical studies would compare.

The authors are absolutely correct in suggesting that these tax dollars could be much better spent on evidence-based medical research and health care. Those who read this article in the Skeptical Inquirer should all write their congressional representatives urging them to slash funding for NCCAM or, better yet, eliminate this branch

of the NIH altogether.

David W. Briggs,
Marion, Massachusetts

The Nye Debate with Creationist

I had been unaware of the debate between Bill Nye and Ken Ham ("Bill Nye's Take on the Nye-Ham Debate," Special Report, May/June 2014). Whatever I was doing on Feb 4, 2014, would have taken second priority had I known about it. I immediately went online and watched it all.

Nye stated in his article that he had beaten his opponent badly. From a scientific perspective, he is certainly right. Although some points raised were not as relevant as others, clearly, his was the stronger argument. Unfortunately, as with the Monkey Trial, scientific evidence is not the primary consideration. In any debate between strongly held belief systems, it is the belief systems themselves that are on trial. Recognition of that fact was present throughout the debate but not directly addressed.

Nye should have said to his opponent, "You believe as you do because you interpret a book of religion as a book of history. Many Christians are convinced that is to fundamentally misunderstand the essence of religion." If Nye had availed himself of advice from theologians as well as his science friends, he would have been more effective.

Gordon Clouser
Durango, Colorado

Nye's publicity stunt did a great disservice to skepticism and rationality, which he professes to champion. Believers in the Bible as a factual record of events, or in other mystical nonsense, will not be dissuaded by his ingenuous and trivial arguments, such as that all those animals could not have fit on Noah's boat. The "debate" undoubtedly reinforced the perception of science as impotent compared with the "word of God."

Robert L. Wolke
Professor emeritus of chemistry
University of Pittsburgh
Author, *What Einstein Kept Under His Hat* and others
Pittsburgh, Pennsylvania

Bill did a great job! He understood that the "debate" was a TV show. He prepared and acted accordingly. His generalist approach was the right one. Instead of going into the weeds, he kept things at a level the audience could follow. He treated Mr. Ham with respect and treated his arguments in a serious manner. If you are trying to get through to people, being flippant or sarcastic is exactly the wrong approach.

But, equally important, Mr. Ham played nice. He went along with a format that allowed both sides to get a fair shot at presenting their arguments. Frequently these events are allowed to devolve into a "Christians and Lions" spectacle. Mr. Ham has a coherent and reasonably consistent set of beliefs, which can be found on his website. This allowed Bill to have a pretty good idea what Mr. Ham would say. Finally, Mr. Ham never resorted to the common "I never said that" dodge.

Unfortunately, I think Bill's success means it will be hard to find another "level playing field" situation any time soon. Never debating lets creationists say "they are all a bunch of cowards who don't believe what they say." Instead, the best thing we can all do is spend time doing debate prep at the school of Nye. Everyone will be better off for it.

Patrick J. Russell
Seattle, Washington

Science Indicators Questions

In his News and Comment article "*Science Indicators* 2014" (May/June 2014), Kendrick Frazier describes as ". . . a very interesting circumstance" the increase in correct answers to two questions about belief in the Big Bang and evolution that were asked in *Science Indicators*, after they were reframed by adding prefacing phrases. He deduces that ". . . framing these two potentially contentious questions as scientific ideas elicits far greater support than otherwise."

I suggest the increase in correct answers was more likely to be because the prefacing phrases changed the nature of the questions from being about the personal beliefs of the survey subjects to being instead about what they thought others believed viz a viz whether or not astronomers support the Big Bang and whether the theory of evolution was said by others to explain human development.

Thus, although the outcome of changing the questions is interesting I suggest the reason for that is quite different from the one given in the article.

Ken Brownlie
Woodlands,
Western Australia
Australia

Regarding the "new and very interesting" *Science Indicators* report asking questions with a preface such as "According to the theory of evolution" and showing an increase of over 20 percent in agreement: It is claimed that this shows that framing the questions as scientific ideas increases support. I beg to differ. If I were asked if "the positions of the stars and planets affect our destiny," I would disagree because I regard astrology as rubbish. If I were faced with "According to astrologers, the positions of the stars and planets affect our destiny," I would say "Yes," because that is what astrologers believe. The raw questions are asking for the interviewee's opinion. The "framed" questions are asking for the interviewee's opinion about another group's opinion.

John Ritson
South Croydon
London, England

Consider these statements:

- "The theory of evolution holds that humans are descended from animals."
- "Sen. James Inhofe contends that climate change is the greatest hoax ever perpetrated."
- "According to astronomers, the Universe began in a huge explosion."
- "Nazis believed that Jews were human vermin deserving extermination."

All of them are of the form "X says Y." I contend that all of them are true, that the various Xs did indeed say the various Ys attributed to them.

This does not mean that I believe that the various Ys themselves are all true, and you shouldn't have inferred that, either, from the results of the "*Science Indicators* 2014" survey you reported on in your May/June issue. But you did.

Richard S. Russell
Madison, Wisconsin

Kendrick Frazier replies:

I agree with the three letter writers, up to a point. It is always good to question what survey questions are really eliciting. I didn't infer that the survey respondents held these more pro-science positions when the questions were reframed, I merely said framing the questions this way elicits far greater support than otherwise, a very interesting

circumstance. I personally don't think their beliefs changed either, but nevertheless it seems to indicate that the respondents to the reframed questions at least realized, to a degree, what the scientific consensus view on each of several certain factual issues is. It seems to me that has some import.

My Hidden Animal Experience

Kenneth Feder's Forum piece, "Connecticut's Hidden Animals" (May/June 2014), reminded me of a similar incident I experienced back in the 1980s. On my way home from the night shift job I had at the time, I was driving through the park surrounding the Skokie Lagoons, a make-work project from the Depression Era in that suburb of Chicago. The park was traversed by a two-lane, unlit, sinuous service road. In the distance and directly in front of me I saw a pair of eyes reflecting my headlights back at me. But those eyes were strange. Only distantly illuminated by my headlights, they seemed to be some four feet or so off the ground. They were clearly not the eyes of a deer as they were both pointing in the same direction—at me. But what animal has eyes four feet off the ground with the stereoscopic perspective of a predator? Nervously I continued to approach but those eyes never looked away. I slowed down a bit but that only prolonged my anxiety. Finally I got close enough to see what it was. At the far side of a bend in the road there was a 55-gallon drum that had been converted into a garbage can. The garbage was piled up above the top of the drum and on top of the garbage was a raccoon watching me as I approached. Feeling relieved but a bit embarrassed, I wondered what story I would have told people had I not had the courage to drive up to where those eyes were. I've been a skeptic for a long time but I have to note that, sadly, my rational mind didn't kick in until after the fact.

Ray Sutera
Ocean Grove, New Jersey

Earthquake Magnitude Scale

I was completely astonished to read in Robert Sheaffer's Earthquake Lights column (Psychic Vibrations, May/June 2014) that 'the magnitude scale of earthquakes is exponential: A magnitude six earthquake releases ten times as much energy as one of magnitude five, and so on."

A simple Internet search will show that the earthquake magnitude scale (a measure of amplitude) is logarithmic, not exponential. And the *energy* difference between a magnitude five and a magnitude six earthquake is considerably greater than the factor of ten mentioned in the article.

I agree with Sheaffer's argument against earthquake lights, but such a blatant science error should never have made it into print.

Dan Gealt
D.R. Gealt Consulting Services
Queensbury, New York

B-36 Did Crash Near Border

In Robert Sheaffer's book review "Saucer, Saucer, Who's Got the Saucer?" (May/June 2014) you fell for the same use of innuendo that UFO believers use.

"Throughout the book [Sheaffer writes], *we are treated to many dubious claims. 'A USAF flight surgeon, [Colonel D 'Jack] Klinger, was once given the duty of locating and retrieving a disabled bomber on the U.S./Canadian border, armed with nuclear weapons.' Had such an event actually occurred, we certainly would have heard a great deal about it."*

It was the middle of the Cold War, and these things were kept secret. This incident did indeed happen. A quick search on the Internet will find information on the crash of Convair B-36 44-92075 close to the American/Canadian border.

Ron Matwey
Gaithersburg, Maryland

A Matter of Mass

In the second section of DeBakcsy's article "Stop Heisenberg Abuse! Three Outrageous Misappropriations of Quantum Physics," May/June 2014), he says that an aluminum nucleus has "a mass millions of times greater than that of the electron," but it is really only about 50,000 times.

Kenneth Olum
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God Exists?

Dave Rich (Letters, May/June 2014) takes Harriet Hall to task for taking ". . . as a given the nonexistence of God." Hall reminded Dave that she didn't say that. Yet that is the only reasonable given possible. God's existence is the claim that needs evidence supporting it; the nonexistence of God is a given without that evidence.

There are as many competing versions of God today as there were gods in ancient times. It is not for reasonable people to prove God does not exist; it is for the claimants to provide real evidence to support their claim.

I feel science can indeed tackle the question of God's existence. That claim of existence must be backed with evidence or it simply isn't a viable claim. If God truly existed there would be a plethora of real evidence for him everywhere. Religion has set up this situation of being answerable only to belief and faith because it can't provide that real evidence. Any claim can be so set up. Belief and faith are at heart human wants, understandable and nearly universal.

Let us progress in understanding human psychology, the brain, belief, faith, and human wants. Hopefully we will be able to address all in a more reasonable manner for more people.

David R. Southwick
Enosburg Falls, Vermont

[FEEDBACK

The letters column is a forum on matters raised in previous issues. **Letters should be no longer than 225 words**. Due to the volume of letters we receive, not all can be published. Send letters as email text (not attachments) to letters@csicop.org. In the subject line, provide your surname and informative identification, e.g.: "Smith Letter on Jones evolution article." Include your name and address at the end of the letter. You may also mail your letter to the editor to 944 Deer Dr. NE, Albuquerque, NM 87122.

SKEPTICAL ANNIVERSARIES

by Tim Farley

September 3, 2004: Infomercial pitchman Kevin Trudeau fined $2 million by the U.S. Federal Trade Commission (FTC). His battles with the FTC went on for years, culminating in a ten-year prison sentence in March 2014. The FTC itself turns 100 years old on September 26.

September 8, 1994: The U.S. Air Force published a report revealing that the supposed "Roswell UFO" wreckage came from then-top secret balloon research program Project Mogul.

September 13, 1969: Skeptical cartoon *Scooby-Doo, Where Are You?* premiered on CBS.

September 22, 1904: Physicist Robert W. Wood debunked the existence of N-Rays in a famous letter that *Nature* published seven days later.

September 24, 1964: The Warren Commission Report was published, concluding that Lee Harvey Oswald acted alone in assassinating John F. Kennedy.

September 29, 1914: The hoax that angels were spotted at the Battle of Mons, Belgium (during World War I) originated in a story "The Bowmen" published in the *London Evening News*.

October 6, 1994: L. Ron Hubbard was posthumously awarded the Ig Nobel Prize for Literature for his book *Dianetics*.

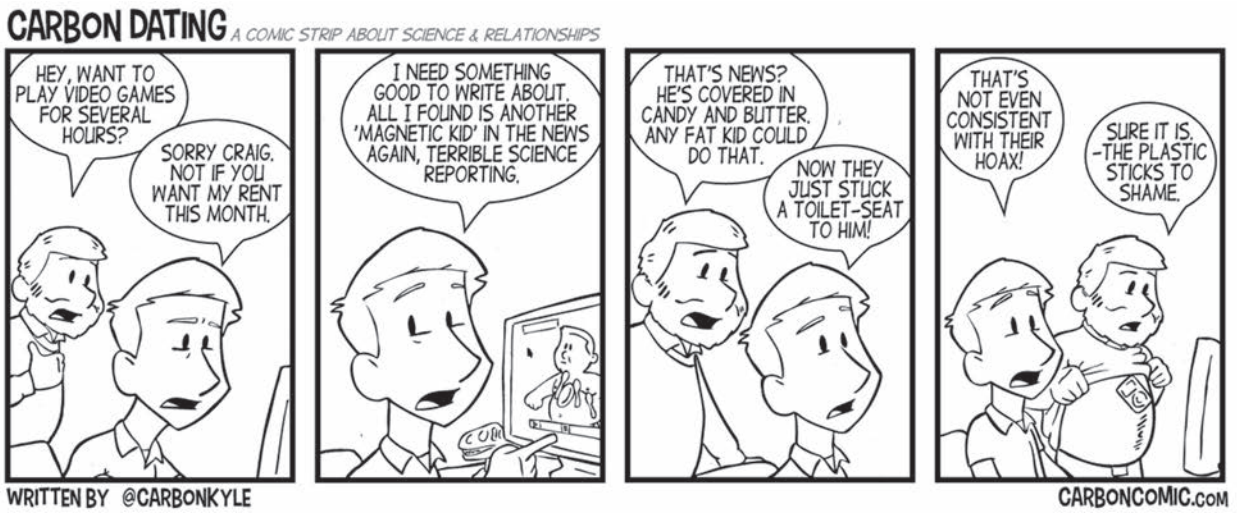
October 20, 1989: A three-day CSICOP workshop titled "Skeptical Inquiry: The Role of the Skeptic" began at SUNY Buffalo. This evolved into the annual "Skeptic's Toolbox" workshop held in Eugene, Oregon, each year.

October 21, 1914: Legendary skeptic and cofounder of CSICOP Martin Gardner was born in Tulsa. Other 100th birthdays this month include psychologist Bertram Forer (October 24) and virologist Jonas Salk (October 28).

October 22, 1844: William Miller predicted the second coming of Jesus Christ on this day; his failure to appear is called The Great Disappointment.

October 25, 1994: The Dietary Supplement Health and Education Act (DSHEA) was signed into law, significantly weakening consumer protections regarding herbals and supplements in the U.S.

Tim Farley is the creator of the website whatstheharm.net and blogs at skeptools.com. He is a past fellow with the James Randi Educational Foundation.


CARBON DATING
A COMIC STRIP ABOUT SCIENCE & RELATIONSHIPS
HEY, WANT TO PLAY VIDEO GAMES FOR SEVERAL HOURS?
SORRY CRAIG. NOT IF YOU WANT MY RENT THIS MONTH.
I NEED SOMETHING GOOD TO WRITE ABOUT. ALL I FOUND IS ANOTHER 'MAGNETIC KID' IN THE NEWS AGAIN, TERRIBLE SCIENCE REPORTING.
THAT'S NEWS? HE'S COVERED IN CANDY AND BUTTER. ANY FAT KID COULD DO THAT.
NOW THEY JUST STUCK A TOILET-SEAT TO HIM!
THAT'S NOT EVEN CONSISTENT WITH THEIR HOAX!
SURE IT IS. -THE PLASTIC STICKS TO SHAME.
WRITTEN BY @CARBONKYLE
CARBONCOMIC.COM

MYSTERY SOLVED
YOU'VE NEVER HEARD OF THE ANTEDILUVIAN ASTROMEN?
EH...NO.
PHILISTINES.
FROM THE DEPTHS OF SPACE, CAME A RACE OF MYSTERIOUS BEINGS. ...NOBODY KNOWS WHO THEY WERE OR WHAT THEY WERE DOING.
AND USING UNKNOWN SPACE TECHNOLOGY, THEY BUILT MONUMENTS BEYOND ANCIENT IMAGINATIONS.
AND THAT'S WHAT HAPPENED, THE ANCIENTS SO MUCH AS SAID SO.
SPACE WIZARDS.
PSST. TRANQ HIM.
CONTINUED NEXT ISSUE!
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